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Predicting Fidelity and Treatment Outcomes in Savoring Interventions Among Mothers of

Young Children

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Abstract

Savoring impacts parents' emotions and parent-child relationship quality. Using data from a randomized controlled trial (*N*=164 mothers of 18-27-month-olds, 37 interveners) conducted with a community sample in the United States, this study examined predictors of fidelity and treatment outcomes across two savoring preventative interventions (relational savoring and personal savoring). Treatment outcome indicators were selected from a battery administered immediately post-intervention (maternal closeness to child) and at a 3-month follow-up (maternal sensitivity, reflective functioning). We examined whether intervener education level (bachelor's degree/no bachelor's degree) predicted fidelity (Research Question 1), whether intervener education level predicted treatment outcomes (Research Question 2), and whether fidelity predicted treatment outcomes (Research Question 3). In many cases, intervener education background was not related to fidelity or treatment outcome; however, interveners without bachelor's degrees showed greater adherence to the protocols on some scales (higher positivity, higher secure base, higher calm matching) and sessions with these interveners were associated with greater increases in maternal sensitivity. Regardless of intervener education level, redirecting attention to the positive and calmly matching participants' tone were associated with higher maternal reflective functioning, and higher secure base scores were associated with greater closeness. Findings have implications for training and implementation of prevention programs for parents.

Keywords: savoring, fidelity, training, home visiting, parenting

Key Finding 1: In many cases, intervener education was not related to fidelity or treatment outcome; however, when it was related to fidelity or treatment outcome, interveners without bachelor's degree showed an advantage, suggesting high potential for dissemination of these interventions.

Key Finding 2: Higher secure base scale scores were associated with greater closeness following savoring, controlling for closeness before savoring.

Key Finding 3: Redirecting attention to the positive and calmly matching participants' tone were associated with higher maternal reflective functioning at follow-up.

Relevance for infant mental health providers: These findings suggest that within the context of working with this community sample, interveners with lower levels of education can deliver these preventative interventions as well as or better than intervener with higher levels of education. This increases the potential for dissemination of these preventative interventions to organizations with fewer resources and/or organizations in which providers do not have advanced training. Further, greater adherence to the protocol is associated with better treatment outcomes, suggesting that it is important to identify factors that promote adherence.

Predicting Fidelity and Treatment Outcomes in Savoring Interventions Among Mothers of

Young Children

Savoring involves enhancing and prolonging positive emotions associated with experiences. People can savor interpersonal experiences, such as moments of felt connection with another person, or they can savor personal experiences, such as a time when they took a walk by the beach. Savoring can be conceptualized as an emotion regulation strategy (e.g., Bryant & Smith, 2015; Bryant & Veroff, 2007). Further, savoring is also a preventative intervention approach that has been applied within the context of infant mental health programs (e.g., Borelli et al., 2022).

Relational Savoring (RS) is a program designed to assist parents in focusing on moments of positive connectedness with their child (Borelli et al., 2020; Burkhart et al., 2016). Initially designed as a prevention program to be delivered to community samples of parents as a stand-alone program, RS can also be integrated into broader intervention approaches for clinical samples (Borelli, 2024) or in existing infant mental health programs. RS involves identifying and immersing oneself in the sensory and emotional experience of a positive memory, then reflecting on its meaning for the relationship (Borelli et al., 2020).

Personal Savoring (PS) involves helping participants savor individual experiences (e.g., listening to a good song, getting a promotion at work) as opposed to interpersonal ones (Borelli, 2024). PS was originally designed as a control condition to compare against RS – the intention was to develop a savoring intervention that improved emotion (increased positive emotion and reduced negative emotion) but did not impact relationship outcomes (Borelli et al., 2022). Indeed, PS has previously demonstrated emotion-related outcomes that are at times comparable to those achieved by RS (e.g., Burkhart et al., 2015; Pereira et al., 2021), but it typically does not

impact relationship outcomes (e.g., Borelli et al., 2022). Particularly for parents of young children, who have fewer opportunities for personal time, savoring positive individual moments may hold unique appeal.

Both RS and PS are one-on-one, intervener-led intervention programs that begin with a mindfulness exercise, followed by two phases – memory selection (phase one), which involves working with the intervener to select a memory that contains intervention-relevant content (RS) or personal pride/contentment content (PS) and positive emotion, and memory reflection (phase two), a five-step process that involves focusing on the memory in different ways in order to heighten and enrich its content (see Borelli, 2024, for an overview). In the most extensive study of RS to date, a randomized controlled trial (RCT) of a community sample of mothers of young children (ages 18-27 months), the intervention was delivered four times over a 4-week period, with mothers randomly assigned to receive either RS or PS. With respect to outcomes, compared to the PS condition, mothers completing RS reported greater closeness to their child and positive emotion immediately following the intervention and demonstrated greater sensitivity to their child at a 3-month follow-up (Borelli et al., 2022). Both RS and PS led to stronger reflective functioning at the 3-month follow-up, via different aspects of savoring (Borelli, Kazmierski et al., 2023). Notably, RS has been applied to other populations as well, yielding positive outcomes for adolescent males in residential treatment (Wang et al., 2019), Latine adolescents and mothers (Borelli, Yates et al., 2021), older adults (Borelli et al., 2019), adults in long-distance romantic relationships (Borelli et al., 2015), and adults with higher depressive symptoms (Straszewski & Siegel, 2018).

Previous studies of RS and PS have used interveners with varying levels of education. In the most extensive study of RS/PS, the interveners were undergraduate college students, post-

baccalaureate research assistants, or developmental psychology graduate students. Prior work suggests that fidelity in the delivery of RS/PS is high and that these two savoring interventions improve several aspects of parenting (emotion, closeness to child, parenting sensitivity; Borelli et al., 2022). However, a gap remains with regard to understanding whether educational attainment influences intervener fidelity to the RS/PS models and/or parenting outcomes. Understanding these associations will enable better precision in future iterations of savoring and other related interventions. Identifying which intervenors are most effective can help developers refine training methods and recruit new interveners (Baldwin & Imel, 2013). Thus, one goal of the current study is to examine the link between intervener educational attainment and parenting outcomes in RS/PS. The data examined in the current study were drawn from this RCT as well, with special attention to the role of education level of the interveners in predicting both fidelity and outcomes, and combining data from RS and PS, as they are both savoring interventions.

Moving the Field Forward: Examining Intervention Fidelity

In prevention and treatment studies, it is vital to evaluate the extent to which programs are delivered as intended (Berkel et al., 2011; Dane & Schneider, 1998; Perepletchikova et al., 2007). This crucial component of program implementation can vary even when delivered in research settings. When deployed in a home visiting or other field context, fidelity is potentially lower due to intervener drift, the relatively less controlled delivery environment, and differing client characteristics. Further, only recently have researchers begun to measure and quantify intervention fidelity and link it to treatment outcomes, with findings generally suggesting that higher intervener fidelity is associated with better client outcomes (Durlak & Dupree, 2008; Fauskanger Bjaastad et al., 2018; Orlando et al., 2022; Roben et al., 2022, see Collyer et al., 2020, for a meta-analysis).

Fidelity, or adherence to treatment protocols as written, has not been extensively studied within the infant mental health sphere (Huth-Bocks et al., 2020), but there are some notable exceptions (e.g., *The Incredible Years*: Webster Stratton, 1990, 2004; *Michigan Infant Mental Health-Home Visiting Program*: Huth-Bocks et al., 2020; *Mothers and Toddlers Program* [also known as *Mothering from the Inside Out*]: Suchman et al., 2012), including in-home visiting programs (e.g., *Attachment and Biobehavioral Catchup*: Caron et al., 2016; Costello et al., 2021; Roben, Kipp et al., 2022; Roben et al., 2022; Schein et al., 2023; *CAPEDP Project* [*Compétences Parentales et Attachement dans la Petite Enfance: Diminution des Risques Liés aux Troubles de Santé Mentale et Promotion de la Résilience*]; Saïas et al., 2012; *right@home*, Kemp et al., 2019; *Healthy Families Massachusetts*, Goldberg et al., 2016). These studies have advanced the field's understanding of the relation between fidelity and therapeutic outcomes, as well as ways to achieve fidelity through training (e.g., Peacock-Chambers et al., 2023). In short, findings show that when interventions are delivered in the home or in other field settings, greater fidelity increases their potency (Rotheram-Fuller et al., 2017).

In other words, psychotherapy research, in general and in the infant mental health field specifically, tends to show that when interveners deliver an intervention with high levels of fidelity, outcomes are more likely to be favorable and to resemble those obtained in more highly controlled settings, but research on this front is limited. The link between fidelity and outcomes has not been tested in the context of savoring interventions. Thus, a question remains with respect to RS and PS: Does intervener fidelity to the model predict intervention outcomes?

Impact of Intervener Education on Fidelity and Therapy Outcomes

Given the early promise of savoring interventions for parents, it is crucial to understand what factors influence intervener fidelity to the model. Understanding more about the conditions

under which fidelity is achieved, as well as whether fidelity predicts treatment outcomes, will enable better precision in future iterations of the RS/PS interventions, and other related interventions. Interveners differ in their ability to deliver interventions, and identifying which interveners are most effective can help developers refine training methods and recruit new interveners (Baldwin & Imel, 2013). In general, interveners differ on a variety of dimensions, including, among other things, their level of education, training, and years of experience. Many infant mental health interventions are delivered by paraprofessionals who hold a high school diploma or bachelor's degree delivering a specific curriculum to support infant/toddler development via parenting quality (e.g. *Early Head Start*, *Healthy Families America*, *Play and Learning Strategies*, *Family Spirit*). RS has exclusively been developed and tested for implementation by interveners without formal clinical training. In fact, no studies to date of RS/PS have been conducted involving interveners with extensive levels of clinical training (e.g., the majority with master's degrees or higher). The majority have involved interveners with bachelor's degrees (e.g., Borelli, Sbarra, et al., 2014), post-baccalaureate research assistants (Wang et al., 2019), graduate students without prior clinical training (Borelli et al., 2019), *promotores* (lay community health workers; Borelli, Yates et al., 2020), or internet-based self-administration of the technique (Borelli, Rasmussen et al., 2014; Burkhart et al., 2015). Even so, in the largest RS/PS intervention conducted to date (Borelli et al., 2022), interveners varied in their levels of higher (non-clinical) education. Thus, we propose to analyze data from this study to determine whether level of education is related to interveners' ability to deliver the intervention with high fidelity and to meet intervention targets.

Prior Studies of Impact of Intervener Education/Training on Treatment Fidelity

Few studies have examined the impact of therapist education level on fidelity or

treatment outcomes, and even fewer have focused on infant mental health prevention or intervention programs. In terms of the broader literature on psychotherapy interventions, the impact of education on fidelity and treatment outcomes is mixed and depends on the setting in which the treatment is delivered, the type of treatment being delivered, and the outcomes examined (e.g., Eells et al., 2005; Mason et al., 2016; Ryan et al., 2023; Walsh et al., 2019). Some studies suggest that years of experience are not associated with fidelity (Caron et al., 2024), others show that intervener experience or possessing a graduate degree is associated with sticking more closely to a protocol or completing more sessions (Garland et al., 2012; Greeson et al., 2009; Podell et al., 2013; Walsh et al, 2019), and some document an advantage in fidelity for interveners with lower levels of education or fewer training hours (Caron et al., 2024; Hogue et al., 2023).

With regard to the infant mental health field in particular, associations between experience and fidelity are also nuanced. Huth-Bocks and colleagues (2020) examined intervener experience as a predictor of self-reported fidelity to the Infant Mental Health-Home Visiting treatment model and documented differences related to experience. Interveners with less than 5 years of experience reported less variability in their use of treatment strategies across the treatment period than those with more than 5 years of experience (Huth-Bocks et al., 2020). In addition, although less experienced interveners provided developmental guidance across the course of the program, more experienced interveners decreased in their provision of developmental guidance, suggesting that more experienced interveners demonstrated more flexibility in adherence to the model, perhaps tailoring the model more precisely to a mother's needs. Although deviating from strict fidelity, this approach is consistent with the best practice of flexibility within fidelity (Kendall & Frank, 2018). In another study, Suchman and colleagues

(2020) found that master's and doctoral-level addiction counselors could be trained to deliver *Mothering from the Inside Out* and *Parent Education* with fidelity, showing post-training increases in the interveners' own clinical reflective functioning post-training. Likewise, in a study of interveners' fidelity in delivering a 10-week home visiting program (Promoting First Relationships), master's level interveners showed a significant increase in treatment-relevant behaviors (e.g., verbal consultation strategies) compared to pre-training levels (Oxford et al., 2018). Savoring interventions like RS and PS differ in important ways from many of the interventions described here, such as the Infant Mental Health-Home Visiting Model (Huth-Bocks et al., 2020) or TF-CBT. That is, RS and PS are relatively streamlined interventions that may be easier for interveners to implement, even interveners with less education.

Prior Studies on Impact of Intervener Education/Training on Treatment Outcomes

The links between intervener characteristics and fidelity in delivery are not simple; similarly, links between intervener characteristics (e.g., education/training) and positive treatment outcomes are also mixed. Within the general psychotherapy literature, some research fails to find an association between therapist education/training and therapy outcomes, such as service usage or treatment discharge (Greeson et al., 2009), treatment non-response (Skar et al., 2022), mental health symptoms (Pfeiffer et al., 2020), or rate of client drop-out (Skar et al., 2022). In comparison, some studies of TF-CBT have shown that interveners with lower levels of education or training achieve positive outcomes, such as reduced symptoms (Fauskanger Bjaastad et al., 2018; Murray et al., 2015) or being a preferred treatment provider (Simmons et al., 2021). Yet other findings point to an overall advantage of higher education and training in terms of client symptoms after treatment (Fauskanger Bjaastad et al., 2018; Podell et al., 2013), but even these findings were nuanced, depending on treatment modality, setting, presenting

problem, and treatment length. In sum, in the broader psychotherapy literature, the impact of clinical experience on outcomes has been assessed across different types of therapies, finding very mixed results.

We turn now to reviewing a single study examining associations between intervener education/training and treatment outcomes within the infant mental health field. In a landmark study of a home visiting program, the level of experience of community mental health interveners (operationalized as more months delivering infant mental health interventions) – all of whom also had a master's degree, clinical license, and were working toward certification in infant mental health specialization – was not directly related to greater gains in parental RF by participating mothers (Stacks et al., 2021). However, there is a caveat: although the intervention called for a dose of 1-2 hours of services per week, the duration of services depended on family needs, and mothers who received more hours of treatment from highly experienced interveners showed the greatest increases in RF.

In sum, research on the role of education or experience level on client outcomes is quite mixed – ultimately, the impact of intervener experience on therapeutic outcomes may depend on the type of program (prevention versus intervention), the population (clinical versus community), and the modality of the intervention delivery (home visiting, clinic administration, virtual versus in person, group therapy versus family/dyadic versus individual). Here it is also worth noting that education level and training in a specific modality are different constructs. While therapist education background can span many years (up to 10 years past secondary school, depending on degree earned), training in a specific modality can occur within a matter of hours or weeks. Further, although there is variability across studies, access to training is often provided free of charge within agencies or research programs, whereas intervener education can be more difficult

to access. We mention these considerations so that readers are aware that prior research on effects of education/training must be differentiated in this way and thus, prior findings might be of limited utility in informing the current project. Here we focus quite precisely on fidelity and treatment outcomes for interveners with two education levels (bachelor's/no bachelor's degree) who all received the same amount of program-specific training and we tailor our outcome measures to the unique characteristics of these savoring interventions.

Current Investigation

We test three research questions designed to advance the evidence base for savoring interventions as delivered within an infant mental health context (see Figure 1). First, we ask, does intervener education level predict fidelity in delivering RS/PS interventions at home (Research Question 1)? We operationalize intervener education level as a binary (bachelor's/no-bachelor's). No-bachelor's interveners had two or three years of undergraduate education. If fidelity is stronger for interveners with higher levels of education, this would suggest that it is important to train interveners who have already earned a bachelor's degree, such as those who are in graduate programs or have master's degrees. However, if the interveners without a bachelor's degree do not differ from those with a bachelor's degree or have superior outcomes to those with a bachelor's degree, then our findings would suggest that this intervention can be effectively delivered by interveners with lower levels of education, which can increase the potential for dissemination of the intervention among community samples.

Second, we ask whether intervener education level (bachelor's/no bachelor's), on its own, predicts treatment outcomes, that is, therapeutic effectiveness (Research Question 2). We examine three key outcomes of our randomized controlled trial – one measured immediately following the intervention administration (closeness to child) and two at the 3-month follow-up

(sensitivity to child, measured with a parent-child interaction task, and RF, measured with coded interview responses). Answers to Research Questions 1 and 2 will help us refine intervener recruitment and/or training in the future.

Finally, we ask whether intervention fidelity, regardless of intervener education level, predicts treatment outcomes (Research Question 3) using the same three outcomes as in Research Question 2. Answering this question will help us ascertain whether our fidelity scheme captures essential ingredients of intervener behavior that are responsible for changes in our core treatment targets.

Method

Mother-Toddler Participants

Participants were recruited via flyers posted in community gathering places and on listservs. Exclusion criteria included the child having a diagnosed developmental delay. Inclusion criteria included the mother being able to speak and read English (for survey and interview completion). To determine sample size, we conducted a power analysis with G*Power assuming a small effect size ($\eta_p^2 = .025$) for a repeated-measures ANCOVA, $\alpha = .05$ and power of .95, with two covariates (estimated) and two groups, suggesting we would need a sample size of 130. We recruited 26% above our desired sample size of $N = 130$ to account for attrition. We stopped recruiting when we had a sufficient number of mothers within each condition. At the beginning of the study, $N = 164$ mothers ($M_{age} = 30.63$ years, $SD_{age} = 5.33$) and their toddlers (18 to 27 months, $M_{age} = 20.93$ months, $SD_{age} = 2.90$) enrolled in this IRB approved study (Borelli et al., 2022). All mothers were enrolled in the study for at least 5 months – approximately one month of baseline assessment, one month of intervention, and three months of follow-up (average of 6.2 months total).

The resulting sample was racially/ethnically diverse (white [65%], Hispanic [41%],[1]

other [13.5%], more than one race [11.8%], Asian/Pacific Islander [6.1%], Black [2.5%], and

American Indian [1.8%]) and 31% earned below $40,000 per year). Most mothers had a partner

(87%) and nearly half of mothers (47.1%) reported not being currently employed, whereas the

remainder were employed full-time (23.5%), part-time (20.0%), self-employed (10.0%), or other

(9.3%). About half (44.7%) of the mothers had at least a bachelor's degree. Most mothers had

one (45.5%) or two (46.2%) children.

Intervener Description

Table 1 provides description of the 37 interveners who assisted with this study. To be

selected as an intervener, candidates had to demonstrate ease in interacting with members of the

research team and indicate that they would be comfortable administering a manualized

intervention. Interveners received four hours of training from the PI, including didactics in

research ethics/professionalism, the theoretical basis of the intervention, and managing risks

(e.g., child abuse reporting). After the didactic portion of the training, the prospective interveners

then practiced the intervention protocol via mock sessions with a study coordinator. The study PI

then reviewed an audio recording of one of these practice sessions and provided feedback. All

interveners attended weekly group lab meetings with the PI to receive feedback on delivering

interventions and to troubleshoot potential issues. For rapport-building and consistency in

intervention delivery, interveners remained with the same mothers for all four in-home sessions.

Interveners led between two and 43 intervention sessions ($M = 16$ sessions) in total. Intervention

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1 At the time of data collection, the term "Hispanic" was widely used, including in the US Census, which is the
reason why we used it as the ethnicity probed in our data collection. In the current report, we use the term "Latina"
to refer to mothers who self-identified as Hispanic. Views differ on the preferred term for this ethnic group
(Cardemil et al., 2020; Noe et al., 2021), but we chose the term Latina as it is recognized by the community and as
all participants in the study self-identified as female.

sessions were conducted with a second research assistant present to ensure the safety and

comfort of the intervener.

In RS, 16 participants worked with interveners with a bachelor's degree and 54

participants worked with interveners without a bachelor's degree. In PS, 22 participants worked

with interveners with a bachelor's degree and 54 participants worked with interveners without a

bachelor's degree.

Procedure

Mothers and their toddlers participated in a laboratory-based baseline assessment,

completing questionnaires and a structured interaction task (NCAST) conjointly. After the

baseline assessment, a random number generator assigned dyads to one of the two savoring

conditions (RS or PS). Intervention sessions were conducted in participants' homes four times

over a four-week period. Three months following the end of the intervention sessions, mothers

returned for an in-laboratory follow-up visit in which they completed the PDI-R, questionnaires,

and repeated the interaction task (NCAST).

Attrition

Of the 164 mothers who began the study, 148 mothers began the first intervention

session, 140 finished the fourth intervention session (for a total of 576 intervention sessions), and

134 mothers completed the follow-up assessment. As reported elsewhere (Borelli et al., 2022),

we examined differences in baseline characteristics between those who did and did not complete

different portions of the study using independent samples *t*-tests and chi-square analyses. Our

analyses revealed no differences between mothers who did and did not begin the intervention

sessions, or between those who did and did not complete the 3-month follow-up, in terms of

child age, mother age, household income, child sex, or mother ethnicity. However, mothers who

began the intervention had higher education than those who did not, $t(163) = -2.24$, $p = .03$.

Dyads who completed the intervention sessions or follow-up visit did not differ significantly

from those who did not on any baseline measures (i.e., closeness to child, parenting sensitivity,

self-reported RF), controlling for participants' educational level.

Savoring Interventions

The majority of the intervention sessions were conducted in participants' homes after

their children had gone to bed for the evening (e.g., around 8 pm). Sessions were audio recorded

for use in fidelity coding.

As in prior studies (Borelli et al., 2019, 2022), intervention sessions began with a one-

minute mindfulness exercise involving deep breathing and relaxation. Interveners then began the

two-step savoring protocol (step one: memory selection, step two: memory reflection). In

memory selection, interveners follow steps to generate at least two memories that fit the

specifications of their savoring protocol (RS or PS), and ultimately select one of these to focus

on during the reflection stage (see Borelli, 2024 for more details). In RS, interveners helped

mothers choose a memory that involved positive connectedness (a time when the mother enjoyed

feeling close and connected to her child), secure base provision (a time when the mother

supported the child's exploration, growth, or development), or safe haven provision (a time when

the child needed comfort and the mother provided it). In PS, mothers were asked to select a time

when they were happy, content or relaxed while they were alone, doing something just for

themselves. During the memory reflection stage, interveners guided mothers through five pre-set

prompts. The prompts encouraged mothers to reflect upon 1) the sensory details of the memory;

2) the emotional content of the memory; 3) the meaning-making/cognitive aspect of the memory;

and 4) the significance the memory held for the participant's future; 5) open-ended mind-wandering.

  Interveners were encouraged to help mothers co-construct their narratives, be curious and ask questions, and to comment on positive aspects of the mother's behavior. They were also trained to help mothers stay with positive aspects of their experiences and with content that was consistent with their intervention condition (e.g., personal content in the personal condition). The whole savoring session typically lasted 20 to 40 minutes.

Measures

Fidelity

  We coded interveners' adherence to the treatment protocols (both RS and PS) using a fidelity coding system developed for these interventions and based on other fidelity measures for mentalization-based treatments (see Suchman et al., 2017). Three fidelity scales assessed general intervention strategies used in savoring (*intervener elicits two sample memories*, *intervener elicits positive emotions*, *intervener redirects participant's attention back to the positive aspects of the memory*); two scales assessed general rapport-building behaviors (*using a calm voice/matching participant's cadence, keeps questions flowing)*; two scales assessed behaviors specific to RS *(elicits relational memory, elicits secure base/safe haven memory content)*; and one scale assessed the quality of the therapeutic environment for savoring *(the savoring intervention was interrupted by something).* Each scale was coded on a two- (yes /no) or three- (agree/not sure or unclear/disagree) point scale, yielding scores ranging from 1-2 or 1-3 (see Table 2). All scales were rated for all sessions even though some scales were specifically tailored to RS.

Savoring sessions were rated for fidelity by a group of 14 coders. All coders participated in training where they reviewed the manual, listened to recordings of savoring sessions, and then practiced applying the coding system to the sessions. In rating the sessions, trainers directed coders to pay attention to interveners' behavior without considering participants' responses to the intervention. Coders were not informed of participants' savoring condition. We lacked fidelity coding for 3 participants due to missing or corrupted audio files.

Treatment Outcomes

Closeness to Child. Mothers completed the Inclusion of Others in Self Scale (IOS; Aron et al., 1992), a single-item pictorial measure, before and after each savoring session. The IOS presents seven Venn-like diagrams with different degrees of overlap of two same-size circles such that more overlap indicates greater closeness between mother and child. One circle in each pair is labeled "self" and the second circle is labeled " child." Participants answered the question, "Which of the following 7 pictures describe your relationship with your child?" Typically the scale has been used to assess closeness in romantic relationships (Agnew et al., 1998; Aron et al., 1992; Uleman et al., 2000); however, recent work (Woonsam et al., 2006) used the scale to determine degree of closeness across various interpersonal relationships, including parent-child relationships (Brummelman et al., 2013; Sichko et al., 2015). In this work, higher IOS scores are associated with weaker links between parent overcontrol and child depression (Sichko et al., 2016) and wanting one's child to fulfill one's unfulfilled dreams (Brummelman et al., 2013).

For analyses in this study, we calculated a mean score of the ratings made before each of the four savoring sessions (pre-savoring score) and a mean of the ratings made after each of the four sessions (post-savoring score).

Parenting Sensitivity. At the baseline and three-month follow-up visits, mothers and toddlers completed the Nursing Child Assessment Satellite Training: Parent-Child Interaction Teaching Task (NCAST; Barnard & Eyres, 1979). In this standardized interaction task designed for children between the ages of 0 and 36 months, mothers choose the first activity from a list of activities that increase in difficulty that they think is just beyond their child's ability (e.g., stringing beads, drawing a straight line). Mothers are tasked with teaching their child how to perform the chosen activity and given up to seven minutes to complete the activity; the researcher then leaves the mother alone with the child. If the child completes the activity in under one minute, the researcher returns and asks the mother to choose a more difficult activity. The task ends when 7 minutes have passed or the mother indicated the activity/teaching was complete, whichever happens first.

We video-recorded the NCASTs and later coded them using the NCAST PCI-Teach assessment tool, a 73-binary-item checklist (Barnard & Eyres, 1979). In line with our prior work (Borelli et al., 2022), here we used the Sensitivity to Cues subscale, which we refer to as maternal sensitivity. This subscale consists of 11 items that measure the parent's ability to accurately read the child's cues, a requirement for mothers to appropriately modify their behavior (e.g., caregiver pauses when child initiates behaviors; caregiver positions child so that child can reach and handle teaching materials). The possible range of scores on this scale is 1 to 11. This scale assesses broad skills that form the foundation for parenting sensitivity, whereas other NCAST subscales are related to specific aspects of parent-child interaction (e.g., Cognitive Growth Fostering). The NCAST provides scores based on observations of parent-child interactions. There are not established clinical cutoff scores for the NCAST, but higher scores

indicate more positive parent-child interactions. NCAST interactions were coded by two certified

NCAST coders; interrater reliability (Kappa) on 22.5% (n = 67) of the total sample of NCASTs

(164 baseline and 134 follow-up) was .68, *p* < .001, which is considered substantial. We were

missing three NCASTs at baseline due to equipment malfunction.

Reflective Functioning. At the three-month follow-up, mothers completed the PDI-R

(Slade, Aber, et al., 2004), a gold-standard measure of parental RF. This semi-structured

interview offers parents the opportunity to discuss their emotional experiences in parenting by

presenting them with a series of questions about their children's (e.g., *Can you tell me about a*

time when your child felt rejected?) and their own emotions (e.g., *Can you describe a time when*

you and your child were really clicking?). Total scores on the PDI-R range from -1 (negative or

bizarre RF) to 9 (marked RF). Scores between 4 and 6 are considered moderate, scores of 3 or

below are considered low, and scores of 7 or above are considered high (Fonagy et al., 1998).

Parents' scores on the PDI-R are associated with parenting sensitivity and children's attachment

security (e.g., Grienenberger & Slade, 2005; Slade et al., 2005).

The PDI-R was administered to mothers by a trained research assistant. Interviews were

audio-recorded, transcribed verbatim, checked for quality, and coded by one of three

postgraduate researchers who were trained and certified in RF coding (Slade, Bernbach et al.,

2004). Twenty percent of the interviews (20%; n = 25) were coded by another researcher to

establish inter-rater reliability. ICCs on all scales of the PDI were above .70, *p*'s < .001. Nine

PDIs were missing due to data loss, equipment malfunction, or shortened visits (e.g., childcare

issues). Consistent with our prior work with this sample (Borelli et al., 2022, 2023), we used

mothers' overall RF scores as our measure of RF.

Potential Covariates

Due to resource constraints, we were unable to administer the PDI at baseline, but we administered the Parental RF Questionnaire (PRFQ; Luyten et al., 2017) to determine if the groups differed in self-reported RF. The PRFQ consists of three subscales, with all items rated on a 7-point scale, ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*: Pre-Mentalizing (the tendency to defensively block mentalizing; *Often, my child's behavior is too confusing to bother figuring out;* $\alpha = 0.66$), Certainty about Mental States (the confidence a parent has about knowing their child's thoughts and feelings; *I always know why my child acts the way he or she does;* $\alpha = .79$), and Interest and Curiosity (the parent's desire to know about the child's internal world; *I wonder a lot about what my child is thinking and feeling;* $\alpha = .75$). High scores on the Pre-mentalizing and Certainty scales indicate low RF, whereas high scores on the Interest and Curiosity scale indicate high RF. Prior work suggests that two of the subscales (Interest/Curiosity and Certainty) are significantly correlated with PDI global scores (Anis et al., 2020, although see Carlone et al., 2023 for conflicting results).

The baseline PRFQ scores in this sample were as follows: $M_{Prementalizing} = 1.51$ ($SD = 0.69$), $M_{Certainty} = 4.07$ ($SD = 1.18$), $M_{Interest\ and\ Curiosity} = 6.28$ ($SD = 0.75$). We examined whether the means obtained in our sample differed significantly from those obtained in the clinical (mothers with substance use disorders, mothers with psychiatric diagnoses) and community samples reported by Carlone and colleagues (2023). We found that the scores were higher than both community and clinical samples on some PRFQ scales and lower on others, as displayed in Table 3.

Analytic Plan

First, we calculated descriptive statistics for the variables of interest and checked data for normality using the Shapiro-Wilks test. When data followed a non-parametric distribution, we

used non-parametric tests (e.g., Wilcoxon Mann-Whitney test; Spearman's rank Correlation

Coefficient). Second, we calculated Pearson correlation coefficients among continuous variables

or examined associations between categorical variables using chi-square independence tests.

To explore our first research question, we used mixed models (*lmer*), specifying a

different model for each dependent variable (each of the fidelity measures), with interveners'

education level and condition as fixed effects. We conducted our analyses using both conditions

combined, controlling for condition in analyses. In order to account for individual intervener

effects, we specified intervener as a random intercept. Initially, we also controlled for

participants' education levels in the models, but the inclusion of this variable did not change the

pattern of effects, so we present the reduced models here.

Similarly, to explore our second research question, we specified separate mixed models to

test whether the education level of the interveners affected the three treatment outcomes of the

savoring intervention. We conducted our analyses using both conditions combined, controlling

for condition in analyses. We tested models using closeness to child, parenting sensitivity, and

RF as dependent variables, respectively, with education level and condition as fixed predictors,

and with intervener as a random intercept.

To test our third research question, we investigated whether interveners' fidelity scores

predicted the three treatment outcomes, namely, Closeness to Child (IOS) immediately after the

intervention, and Parenting Sensitivity and RF at the 3-month follow up. All fidelity measures

(except for question flow and interruption, see below) and condition were treated as fixed effects;

baseline levels of the outcome variables were entered as covariates and intervener was included

as a random intercept. We utilized Corrected Akaike Information Criteria (AICc) to discriminate

between more complex and simpler models. All analyses were performed using *R* software (R

Core-Team, 2021).

None of our research questions considered time-related changes – we were chiefly interested in education-of-intervener effects or fidelity effects on the outcomes over the entirety of the intervention. Therefore, we did not consider time (i.e., the four sessions of intervention) as a fixed or random variable. In addition, we were less interested in differences in fidelity or intervention outcomes across condition because these differences have been the subject of prior studies (Borelli et al., 2022). Further, we consider both RS and PS to be interventions that operate through different mechanisms (Borelli, Kazmierski et al., 2023). Nevertheless, condition is included as a fixed factor in analyses to account for any differences in fidelity or outcomes that were due to the treatment condition. In essence, in this study, we examined the effects of education or fidelity on outcomes, above and beyond treatment condition; we report condition effects when they occurred.

Results

Descriptive statistics for the variables of interest are reported in Table 1 and associations among variables in Table 4. After examining distributions of the fidelity variables, we decided not to include two fidelity scales (*question flow* and *interruption*) in subsequent analyses due to low variability and low frequency, respectively (see Table 2). Nearly all interveners earned high scores on *question flow* and low scores on *interruption*; thus, variability in these aspects of adherence was negligible.

We used chi-square tests to determine whether the experimental groups (RS versus PS) differed in self-reported baseline scores on any of the PRFQ subscale scores; because the groups did not differ, we did not include baseline PRFQ scores in our models involving RF, a strategy consistent with our prior work using this dataset (Borelli et al., 2023). Further, a chi-square test

revealed that interveners' education level did not differ significantly between RS and PS.

Research Question 1: Does intervener education level affect fidelity?

To answer our first research question, we fitted a series of models to investigate the role of education in predicting fidelity. We conducted six models, one for each fidelity measure, with education level and condition as fixed effects. Results of ANOVAs and the Wald F test using the Kenward-Roger method suggest that interveners who delivered RS/PS without a bachelor's degree had significantly higher fidelity scores on the following scales: positivity, secure base, and calm matching (see Table 5). Interveners who delivered the RS intervention had higher fidelity scores on secure base content, relational, and redirecting.

Research Question 2: Does Intervener Education Level Affect Treatment Outcome?

The second research question explored whether the education level of the interveners affected the three treatment outcomes of the savoring interventions. We tested three separate models for each of the dependent variables, with education level and condition as fixed predictors, controlling for baseline levels of the dependent variable in the first two models, and including a random intercept for intervener. See Table 6 for results.

Of all models, education level of intervener significantly predicted only parenting sensitivity at the three-month follow-up, such that sessions run by interveners without bachelor's degrees were associated with higher parental sensitivity at follow-up, controlling for baseline levels of sensitivity and condition (see Figure 2). Education level was not a significant predictor of closeness to child or RF at follow-up, after controlling for baseline levels.

Research Question 3: Does Fidelity Affect Treatment Outcomes?

Our third research question aimed to investigate if interveners' fidelity predicted treatment outcomes of the savoring interventions, namely, closeness to child (IOS) immediately

after the intervention, and parenting sensitivity and RF at the 3-month follow up across conditions. We used ANOVAs and Wald *F* statistics to test the models. In our first model predicting closeness to child, only one fidelity measure was significant in the model: *secure base/safe haven*. We used the Corrected Akaike Information Criteria (AICc) to discriminate between the more complex model with all variables (AIC = 447.39) and the simpler model with secure base variable only (AIC = 1198.26). The more complex model revealed lower levels of AIC and is therefore considered the final model. Scores on the *secure base/safe haven* fidelity measure significantly predicted closeness to child scores (See Table 7). Higher secure base emphasis by interveners during the RS and PS sessions was associated with higher closeness to child in parents' post-intervention ratings, controlling for pre-intervention levels of closeness to child and condition (see Figure 3). For the model predicting parenting sensitivity, no fidelity measures significantly predicted parenting sensitivity scores at the 3-month follow-up.

In the model predicting RF at the 3-month follow-up, we did not control for pre-treatment level scores of RF because the groups were equivalent on the PRFQ at baseline (see Borelli et al., 2022, 2023). *Redirecting attention* and *calm matching,* were significant predictors of RF at follow-up, across conditions. The AIC criterion was lower for the model considering just these two variables *(*AIC = 474.47), compared to the model containing all the fidelity variables (AIC = 479.68); therefore, the simpler model was considered the final model. In the simpler model, the effect of *redirecting attention* and *calm matching* remained significant. Mothers whose interveners redirected attention and used a voice that conveyed composure that matched the mothers to a greater degree earned higher RF scores at the 3-month follow-up visit (see Figure 4).

Discussion

The purpose of this study was to determine whether interveners' education level predicts intervention fidelity and treatment outcomes, as well as whether adherence to the protocol (fidelity) is associated with key treatment outcomes, as evaluated in a randomized trial of savoring interventions (RS/PS) with mothers of young children. The promise of these interventions will be more fully realized if we have a clearer understanding of the conditions that are necessary for optimal delivery of interventions developed initially online and then moved into a home visiting delivery, with a plan to disseminate it to community agencies.

Our findings revealed that lower educational status (not having earned a bachelor's degree) did not disadvantage interveners in either RS or PS. In fact, when there were differences in fidelity or treatment outcome as a function of educational status, the differences favored interveners without bachelor's degrees. Specifically, interveners without bachelor's degrees led sessions with higher positivity, higher secure base scores, and higher calm matching. Moreover, interveners without bachelor's degrees were not significantly different from interveners with bachelor's degrees on the other three scales (*brainstorming, relational, redirecting attention*). It is worth noting that the scales on which interveners with less education showed an advantage were diverse in scope – they included general savoring skills (*positivity*), RS-specific skills (*secure base/safe haven*), and general clinical skills (*calm matching*).

Further, interveners without bachelor's degrees did not show a disadvantage in terms of the prediction of treatment outcomes. Intervener education was not related to two of the outcomes examined (closeness to child, RF), and participants who worked with interveners without bachelor's degrees had higher parenting sensitivity at the 3-month follow-up, controlling for parenting sensitivity at baseline. As with the set of findings regarding fidelity, on the whole, interveners with less education were not less effective, with some evidence for an advantage for

these interveners with regard to treatment outcomes.

These preliminary findings are correlational, not experimental in nature. It is reassuring that there were equal numbers of interveners with bachelor's degrees who administered PS and RS, but random assignment of interveners with varying levels of education to deliver the interventions to participants would be a stronger test of education effects. Nevertheless, the findings preliminarily suggest that interveners without bachelor's degrees not only can, but perhaps should, be trained to administer these savoring interventions. These findings are consistent with prior work suggesting that interveners with lower levels of education and/or training can sometimes deliver manualized treatments with higher adherence and have more positive impacts on participants (e.g., Fauskanger Bjaastad et al., 2018; Goldberg et al., 2016), or that interveners' education and/or years of experience are unrelated to outcomes (Hill & Knox, 2013; Thirwall et al., 2013).

Further, our findings suggest that intervener adherence to certain fidelity dimensions was associated with treatment outcomes. Specifically, interveners who scored higher on the *secure base/safe haven* fidelity scale in their sessions had participants who scored higher on the inclusion-of-other-in-self scale, which assesses closeness to the child, assessed immediately following the savoring sessions, even after controlling for condition. Notably, scores on this fidelity scale were higher in the RS condition, which makes sense given the relevance of focusing on attachment memory content in RS. It is interesting to note that although *relational* and *secure base/safe haven* are very strongly correlated, only secure base/safe haven predicts IOS scores. In fact, conducting separate analyses for *relational* and *secure base/safe haven* dimensions revealed important information regarding the specific aspect of savoring that seems to help mothers feel closer to their children. Also important, this fidelity scale captures the

intervener's behavior during the memory selection portion of the task, measuring their attempts to solicit a memory that includes secure base content from the participant. In interpreting this effect, it is important to keep in mind that it is the interveners' scores on this scale rather than a closely related scale (the *relational* scale) that were related to participants' feelings of closeness to their child. Scores on the *relational* scale evaluate the degree to which a parent's memory is relational in nature (though not explicitly pertaining to attachment content). Thus, the secure base finding suggests that the degree to which the intervener targets specific attachment content drives the effect on closeness to child rather than the degree to which the intervener targets a more general relational memory. Targeting attachment content is a crucial component of the intervention and a guiding principle of the training. That is, interveners are trained in the importance of selecting a memory that has attachment content rather than more general connectedness content, if such a memory is available to the parent. Currently, it is unknown how the specific content of parents' selected memories pertains to outcomes of savoring, but the current findings suggest that intervener behavior that directs mothers toward attachment-based memories is related to greater increases in closeness to child.

    With respect to RF scores at the 3-month follow-up, we found that adherence to two of the fidelity scales – greater *redirection* to the positive emotion and greater *calm matching* – predicted higher RF scores. These associations support the theoretical basis of the intervention. One of the core premises of savoring interventions like RS and PS is that focusing on positive emotions supports a broadening of attentional focus (Fredrickson, 2005; Kok & Fredrickson, 2010), helping parents to create space to reflect more deeply on their own and/or their child's emotions. Consistent with our current finding, we reported earlier that both RS and PS are associated with higher levels of RF at follow-up, but through different pathways – connectedness

and specificity (for RS) and self-focus (for PS), respectively (Borelli, Kazmierski, et al., 2023).

That is, when interveners help participants stay focused on the positive emotion associated with

the memory or experience, they might be helping mothers achieve the goals of savoring that, in

turn, allow them to develop greater reflective capacity.

Similarly, when interveners had higher scores on the *calm matching* scale, participants

had higher levels of RF at follow-up. This finding suggests that when the intervener helps the

mother maintain her contemplative state throughout the savoring session, this promotes reflective

capacity. Fonagy and Slade have discussed the importance of moderate levels of arousal in order

for mentalizing to occur (Fonagy, 2012; Luyten et al., 2020; Slade, 2005) – we believe that this

may be true when re-experiencing autobiographical experiences as well. In interpreting these

findings, it is worth noting that the participants in this community sample had relatively high RF

scores on the PDI-R at the follow-up assessment, suggesting that they may not have required

much intervention to mentalize. In addition, their baseline PRFQ scores were higher than clinical

samples (see Carlone et al., 2023, for a reference point). To probe whether baseline levels of RF

were related to intervener fidelity, we examined associations (Spearman's rank correlations)

between baseline PRFQ scores and intervener behavior (redirecting attention and calm

matching). Higher scores on the Interest and Curiosity Scale predicted higher *redirecting*

attention scores, but the other PRFQ scores were unrelated to redirecting attention, and none of

the three PRFQ scores were related to *calm matching*. This suggests that in general, baseline

levels of participant RF were not related to intervener fidelity, even though on average, the

sample had high RF at baseline.

Implications

These findings have important implications for the development of these savoring

interventions. First, they suggest that interveners with lower levels of education can deliver these

interventions with high levels of fidelity with a community sample. Interveners without

bachelor's degrees performed equally well or better than interveners with bachelor's degrees on

the fidelity scales examined. A significant caveat regarding these findings pertains to the fact that

this current trial involved a community sample – the sample was ethnically diverse but did not

present with other risk factors. It is unknown whether similar patterns would emerge if savoring

were administered to a clinical sample or to individuals with other risk factors. Further, in the

current study, the interveners without bachelor's degrees were undergraduates at a selective

liberal arts college. Thus, these findings may not generalize to samples in which interveners have

different levels of educational attainment or motivation for learning. Nonetheless, these findings

suggest that these savoring interventions, such as RS and PS, are strong candidates for inclusion

in infant mental health programs, such as home visiting programs or Early Head Start. Future

studies can examine whether these interventions exert a strong enough impact on their own or

are better paired with existing interventions.

More generally, when identifying the most optimal interveners for a sample, it is

important not to exclusively consider education or training; it is also important to consider the

degree of acceptability of the interveners to the community, which was not a focus of this RCT.

In our current and past work, we have delivered RS as part of a broader attachment-based

prevention program to low income Latine families – in these studies, the interveners have been

promotores (lay community health workers). To date we have not compared delivery by

promotores to delivery by mental health clinicians, but the promotore-led intervention met with

high levels of acceptability (Borelli, Yates, et al., 2020; Borelli, Russo, et al., 2021). We

concluded that the inclusion of promotores in the co-development and delivery of the prevention

programs only enhanced its appeal. The appeal extended to the promotores themselves:

following their involvement in delivering the intervention, they requested that the program

developer modify it for use with promotores, a project currently underway (Arcos et al., 2024).

Findings such as these are notable as they challenge the assumption that highly trained

professionals should be privileged for delivery of psychological intervention programs. Indeed,

people with less academic training can acquire the requisite technical skills and at the same time

embody values that are culturally resonant with underserved communities. The simplicity of the

program we delivered may be a crucial component here – both RS and PS, as well as the

attachment-based intervention program described above (Borelli, Yates et al., 2020) were

designed to be administered by paraprofessionals, and therefore, have a streamlined framework

in terms of training and implementation. RS and PS can be embedded in other infant or family

mental health programs or delivered independently to parents who may not need mental health

treatment.

      Returning to the findings of the current investigation, the fact that interveners without

bachelor's degrees performed on par or better than those with bachelor's degrees lowers the bar

in terms of the training credentials required to administer RS and PS, increasing the potential for

dissemination. It also begs the question, why did interveners without bachelor's degrees achieve

better outcomes than those with more education? This will be important to examine in future

studies in which more data are collected on interveners.

      The findings provide promising directions for further development of the fidelity measure

as well. Our use of an observer-rated fidelity measure (as opposed to an intervener self-rated

scale) is a strength of the study. The fact that the secure base/safe haven scale predicted mothers'

feelings of closeness to their child, a key outcome measure in the intervention, is theoretically

consistent with the underlying premise of RS and enhances confidence in its tenets. Further, in simplified analytic models, interveners' use of redirecting attention and calm matching – two other elements of fidelity – were related to greater participant RF, which is also consistent with tenets of this attachment- and mentalization-based intervention. Together, these findings suggest that centering the training in the core principles of this intervention is crucial. Being present for the client, staying calm and grounded (which is often facilitated by the intervener engaging in the mindfulness exercise alongside the client; Borelli, 2024; Borelli et al., 2020), and then leaning into attachment or personal pride/contentment content to help the client explore moments of felt security might foster the development of RF.

As we have noted, our analyses collapsed data from RS and PS, suggesting that these intervener behaviors are important for enhancing RF in both forms of savoring. Prior findings from the same study revealed distinct pathways to higher RF through each of these forms of savoring (Borelli, Kazmierski et al., 2023). Thus, training interveners in the principles of attachment theory, sensitive care (and self-care), and positive emotion/savoring (Fredrickson & Branigan, 2005), as well as techniques for heightening this content within therapeutic sessions (Borelli, 2024), is of the utmost importance. Techniques for accomplishing this type of training should be evaluated for their efficacy in order to promote future implementation and dissemination efforts.

Conclusion

These findings provide a preliminary glimpse into those factors that promote successful implementation of savoring interventions among mothers of young children. Specifically, our findings suggest that interveners with lower levels of education (without a bachelor's degree) are equally or more likely to achieve high levels of fidelity as those with a bachelor's degree, as well

as more desirable treatment outcomes. Further, certain fidelity scales predict positive treatment

outcomes – focusing on these dimensions of fidelity may help us further refine these

interventions as well as our efforts to assess them.

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Table 1. *Demographic Data for Interveners*

	Combined Sample	Without Bachelor's	With Bachelor's
Variable			
N	37	26	11
% Female	81.1%	79.5%	20.5%
% White	55.1%	61.2%	39.5%
% Asian American	23.5%	18.4%	36.8%
% Latine	13.2%	9.2%	23.7%
% Biracial/Multiracial	7.4%	10.2%	0.0%
% African American	0.7%	1.0%	0.0%

Table 2. *Descriptive Statistics for Fidelity Measures and Savoring Outcomes and Group Differences by Condition (RS, PS)*

Fidelity Measure	Total M(SD)	Personal M(SD)	Relational M(SD)	Range	Wilcoxon W
Brainstorming	1.00 (0.21)	0.99 (0.19)	1.01 (0.24)	1-2	W=39344
Positivity	2.97 (0.19)	2.98 (0.14)	2.96 (0.22)	1-3	W=41076
Relational	2.02 (0.99)	1.15 (0.52)	2.94 (0.32)	1-3	W=3721***
Secure Base	1.96 (0.99)	1.12 (0.47)	2.84 (0.50)	1-3	W=4799***
Calm Match	2.95 (0.26)	2.93 (0.31)	2.97 (0.20)	1-3	W=39242
Question Flow	2.98 (0.16)	2.97 (0.18)	2.99 (0.12)	1-3	W=40056
Interruption	0.15 (0.36)	0.15 (0.36)	0.15 (0.36)	0-1	W=40448
Redirection	2.56 (0.60)	2.46 (0.65)	2.67 (0.52)	1-3	W=2877*
Savoring Outcomes					
IOS Pre-Savoring	5.15 (1.31)	5.15 (1.42)	5.15 (1.18)	1-7	W=4439
IOS Post-Savoring	5.27 (1.48)	4.92 (1.65)	5.65 (1.16)	1-7	W=3286***
Reflective Functioning	4.99 (1.14)	4.81 (1.12)	5.18 (1.14)	2-8	W=25688***
Sensitivity Baseline	8.93 (1.22)	9.05 (1.13)	8.80 (1.29)	6-11	W=46600**
Sensitivity Follow-Up	9.32 (1.06)	9.25 (1.01)	9.39 (1.10)	6-11	W=31752*

Note: Calm Match = Calm Matching; *p < .05. ** p < .01. *** p < .001.

Table 3. *Comparison of Current Sample PRFQ Scores With PRFQ Scores Reported in Carlone and Colleague's Study*

	Sample 1 (Community Sample – Mturk)	Sample 2 (Previous Psychiatric Diagnoses)	Sample 3 (Mothers with Substance Use Disorders)
PRFQ Pre-Mentalizing Modes	$t(374) = -6.213$****	$t(404) = -8.068$****	$t(298) = -0.471$
PRFQ Certainty of Mental States	$t(374) = -0.681$	$t(404) = 17.064$****	$t(298) = 2.285$*
PRFQ Interest and Curiosity	$t(374) = 8.646$****	$t(404) = 6.323$****	$t(298) = 0.242$

Note: *$p < .05$, ****$p<.0001$

Table 4. *Spearman's Rank Bivariate Correlations among Intervener Fidelity and Maternal Outcome Variables*

Measure	Brain-storming	Positivity	Relational	Secure Base/ Safe Haven	Calm Match	Question Flow	Interruption	Redirecting Attention
IOS	0.10*	0.03	0.22***	0.23***	0.01	-0.03	0.03	0.16*
RF Follow-Up	0.02	0.05	0.14**	0.13**	0.05	0.04	-0.05	0.15
Sensitivity Follow-Up	-0.05	0.05	0.13**	0.14**	0.00	-0.00	0.06	-0.07

Note. *p<0.05; **p<0.01; ***p<0.001; **IOS** = Closeness to Child; **RF** = Reflective Functioning; **Calm Match =** Calm Matching.

Table 5. *Results of Mixed Models: Intervener Education Level and Fidelity.*

	b(SE)	*t*(df)	*p*-value (*T*)	Wald *F*(df)	*p*-value (*F*)
Model 1: Brainstorming					
Predictors					
1. Educational level	0.04(0.03)	1.39(52.45)	0.17	1.87(60.78)	0.18
2. Condition	0.03(0.02)	1.72(490.71)	0.09	2.90(499.94)	0.09
Model 2: Positivity					
Predictors					
1. Education level	**0.08(0.02)**	**4.40(562)**	**<0.001**	**18.36(37.64)**	**<0.001**
2. Condition	-0.03(0.02)	-1.78(562)	0.08	3.10(414.04)	0.08
Model 3: Relational					
Predictors					
1. Education level	0.06(0.07)	0.82(107.27)	0.42	0.65(121.99)	0.42
2. Condition	**1.80(0.04)**	**47.99(556.61)**	**<0.001**	**2284.17(557.41)**	**<0.001**
Model 4: Secure Base					
Predictors					
1. Education level	0.20(0.08)	2.64(126.87)	0.009	6.76(143.05)	0.01
2. Condition	**1.74(0.04)**	**41.80(560.40)**	**<0.001**	**1734.35(560.63)**	**<0.001**
Model 5: Calm Match					
Predictors					
1. Education level	**0.06(0.03)**	**2.34(43.92)**	**0.02**	**5.26(45.20)**	**0.03**
2. Condition	0.04(0.02)	1.76(443.71)	0.08	3.04(446.61)	0.08
Model 6: Redirecting Attention					
Predictors					
1. Education level	-0.02(0.11)	-0.19(27.72)	0.85	0.03(38.73)	0.86
2. Condition	**0.19(0.09)**	**2.09(162.96)**	**0.04**	**4.29(162.97)**	**0.04**

Note. Significant values are indicated in bold.

Table 6. *Results of Mixed Models: Intervener Education level and Treatment Outcomes.*

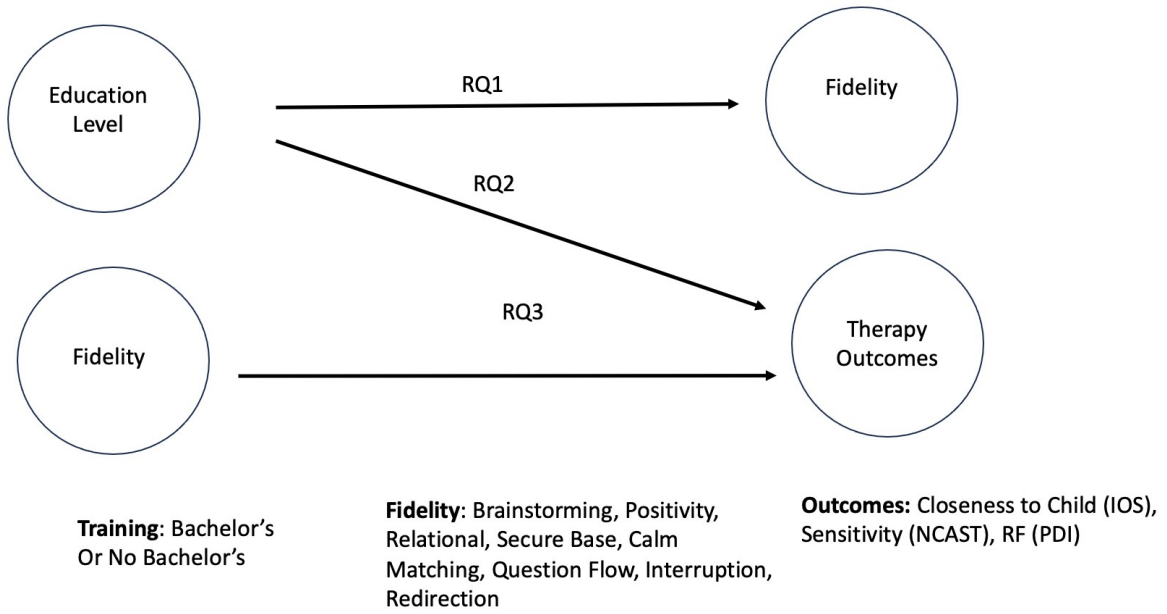|	b(SE)	t(df)	p-value (T)	Wald F(df)	p-value (F)
Model 1: IOS					
Predictors					
1. Educational level	-0.10(0.13)	-0.79(197.67)	0.43	0.60(234.77)	0.44
2. Condition	**0.78(0.06)**	**12.59(578.79)**	**<0.001**	**157.64(579.08)**	**<0.001**
Covariates					
IOS pre levels	**0.95(0.02)**	**41.16(574.77)**	**<0.001**	**1687.04(576.01)**	**<0.001**
Model 2: Sensitivity					
Predictors					
1. Education level	0.32(0.16)	2.00(137.68)	0.048	3.87(146.61)	0.05
2. Condition	0.15(0.09)	1.69(508.88)	0.09	2.84(509.14)	0.09
Covariates					
Baseline Sensitivity	**0.21(0.04)**	**5.49(508.74)**	**<0.001**	**29.86(509.01)**	**<0.001**
Model 3: RF					
Predictors					
1. Education level	-0.11(0.19)	-0.56(204.81)	0.58	0.31(204.81)	0.58
2. Condition	**0.48(0.10)**	**4.76(491.65)**	**<0.001**	**22.66(491.65)**	**<0.001**

Note. Significant values are indicated in bold.

Table 7. *Results of Mixed Models: Adherence to Treatment and Treatment Outcomes.*

|	b(SE)	t(df)	p-value (T)	Wald F(df)	p-value (F)
Model 1: IOS					
Predictors					
1. Brainstorming	0.45(0.28)	1.60(146.00)	0.11	2.54(145.87)	0.11
2. Positivity	0.15(0.33)	0.47(146.69)	0.64	0.22(146.57)	0.64
3. Relational	-0.08(0.34)	-0.23(146.18)	0.82	0.05(146.05)	0.82
4. Secure Base	**0.46(0.22)**	**2.13(156.57)**	**0.03**	**4.46(156.56)**	**0.04**
5. Calm Match	-0.09(0.02)	-0.44(145.71)	0.66	0.19(145.57)	0.66
6. Redirecting Attention	-0.06(0.12)	-0.53(147.11)	0.60	0.27(146.99)	0.60
7. Condition	0.08(0.56)	0.15(151.54)	0.88	0.02(151.47)	0.88
Covariates					
IOS pre levels	**0.93(0.05)**	**17.66(156.22)**	**<0.001**	**305.48(156.21)**	**<0.001**
Model 2: Sensitivity					
Predictors					
1. Brainstorming	0.33(0.30)	1.10(128.67)	0.28	1.20(128.67)	0.28
2. Positivity	0.43(0.37)	1.16(127.75)	0.25	1.34(127.75)	0.25
3. Relational	0.03(0.37)	0.09(127.18)	0.93	0.01(127.18)	0.93
4. Secure Base	0.14(0.23)	0.59(141.97)	0.56	0.35(141.97)	0.56
5. Calm Match	0.06(0.22)	0.25(124.84)	0.80	0.06(124.84)	0.80

6. Redirecting Attention	-0.06(0.13)	-0.46(134.40)	0.64	0.21(134.40)	0.64
7. Condition	0.21(0.61)	0.34(134.86)	0.73	0.12(134.86)	0.73
Covariates					
Sensitivity pre levels	**0.28(0.08)**	**3.58(142.27)**	**<0.001**	**12.80(142.3)**	**<0.001**
Model 3: RF					
Predictors					
1. Redirecting Attention	**0.33(0.16)**	**2.11(134.46)**	**0.04**	**4.38(136.50)**	**0.04**
2. Calm Match	**0.54(0.25)**	**2.17(123.91)**	**0.03**	**4.68(127.73)**	**0.03**
3. Condition	0.21(0.19)	1.09(137.85)	0.28	1.16(139.26)	0.28

Note. Significant values are indicated in **bold**

Figure 1. Research Questions Examined in this Study.

Training: Bachelor's
Or No Bachelor's

Fidelity: Brainstorming, Positivity,
Relational, Secure Base, Calm
Matching, Question Flow, Interruption,
Redirection

Outcomes: Closeness to Child (IOS),
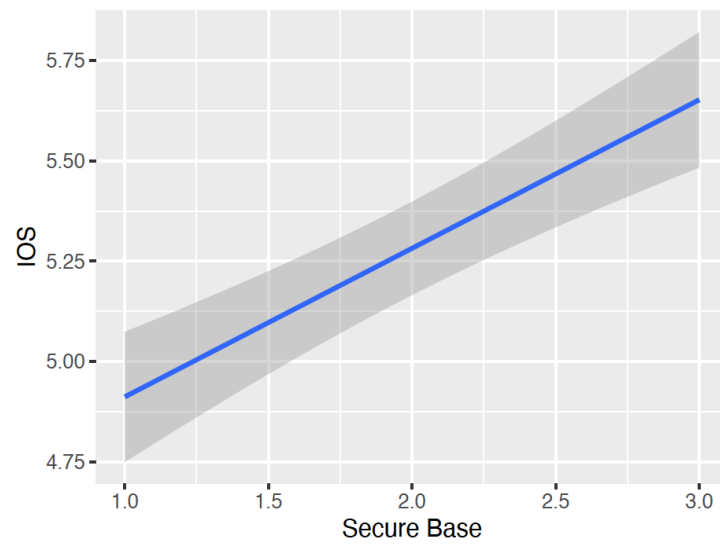Sensitivity (NCAST), RF (PDI)

Figure 2. *Interveners Without Bachelor's Degrees Administer Savoring Sessions that Predict*

Greater Increases in Maternal Sensitivity.
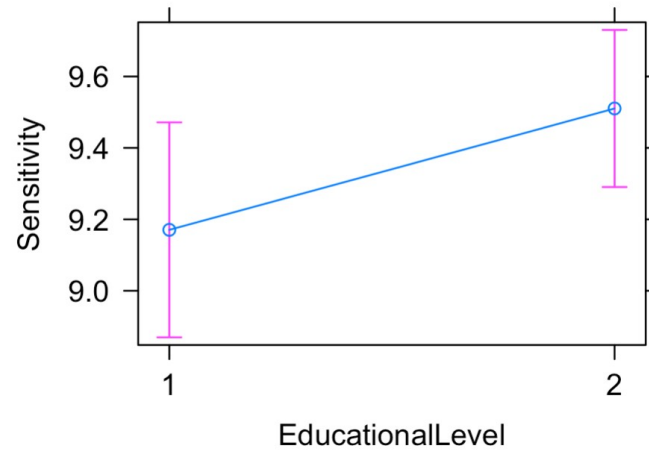
Figure 3. *Higher Scores on Secure Base/Safe Haven Fidelity Scale is Associated with Closeness*

to Child.

Figure 4. *Higher Scores on the Redirecting Attention and Calm Matching Fidelity Scales*

Predict Higher RF at Follow-up.