



Mothering from the Inside Out: Addressing the Intersection of Addiction, Adversity, and Attachment with Evidence-Based Parenting Intervention

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Abstract

Purpose of Review Mothers with substance use disorders are often referred for parenting support, though commonly available programs may miss the mark for families impacted by addiction. This may be related to a lack of attention to children’s emotional needs, mothers’ histories of adversity, and the neurobiological differences seen in mothers with addictions. We review the implications of addiction, adversity, and attachment for parenting interventions. We then describe Mothering from the Inside Out (MIO), an evidence-based parenting intervention designed specifically for mothers with addictions.

Recent Findings Evidence from clinical trials suggests that MIO improves outcomes for two generations: both mothers with addictions and their children. Recent trials demonstrate that MIO may be delivered effectively by community-based clinicians and may be beneficial for parents with other chronic stressors.

Summary Addressing addiction, adversity, and attachment simultaneously may have a positive synergistic effect. Future research should study the implementation of MIO in real-world settings and examine the impact of MIO on maternal neurobiology.

Keywords Maternal substance use · Childhood adversity · Attachment · Evidence-based treatment · Mentalization · Reflective functioning

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“Understanding of minds is hard without the experience of having been understood as a person with a mind.”
Fonagy & Target, 2005, p.334 [1]

Introduction

Given that mothers with addictions are at risk for a range of caregiving challenges [2–8], mothers in substance use treatment are often referred for parenting support by their treatment clinics, child protective services, and obstetrics, gynecology, and neonatal staff [9–12]. Despite consensus about the need to effectively support the caregiving of mothers struggling with addiction, most addiction treatment programs utilize skills-based parenting interventions that have not been tested in clinical trials and ultimately yield modest and inconsistent improvement in caregiving, substance use, psychiatric symptoms, and child outcomes [13–16,17,18]. Generally, the objectives of these commonly available parenting

interventions are to improve parents' skills directly through teaching and coaching. Parents are trained to replace maladaptive parenting practices (e.g., harsh discipline) with positive parenting skills (e.g., reinforcement, planned ignoring), with the goal of supporting child development and reducing problematic child behaviors. Although programs such as these have been widely adopted across the USA, they may miss the mark for mothers with addictions.

Limitations of Skills-Based Approaches

Upon being referred for parenting support, mothers with addictions may struggle to fully engage for a variety of reasons [19], leading to notable discrepancies between the number of mothers who are referred for support versus the number of mothers who enroll (and remain) in services [20]. Recent qualitative work suggests that mothers who are referred for skills-based programs often experience fear, guilt, and shame about their substance use that prevent them from engaging, as well as hesitation to open up to their providers despite a strong desire to feel genuinely understood and cared for [21].

When mothers with addictions do successfully engage in parenting support, outcomes are variable. While skills-based parenting interventions have been shown to influence the parenting practices of mothers with addictions and reduce children's difficult behaviors in the short-term, they have not led to lasting improvement in the quality of the parent-child relationship or children's psychosocial functioning [19, 22–24]. This may be related to the focus that skills-based programs place on procedures of overt behavior management and lack of emphasis on helping parents understand and meet the emotional needs underlying their children's behavior [25–27]. This shortcoming is considerable in light of recent evidence that mothers with addictions demonstrate altered neural responses to infant affective cues (e.g., faces and cries), suggesting that skills training may not sufficiently address the mechanisms underlying caregiving difficulties [28, 29, 30, 31, 32, 33]. Skills-based programs may also have the unintentional effect of increasing parenting stress as parents are encouraged to engage in strategies including time-out and planned ignoring, during which a toddler's difficult behavior may escalate. This potential for increased stress is particularly concerning in the context of families struggling with addiction given that stress may activate neural pathways triggering cravings, substance use, and decreased caregiving sensitivity [34, 35].

Further, most skills-based parenting interventions were developed to address child symptomatology rather than parent symptomatology. Skills-based approaches therefore fail to appreciate that parents with addictions often have their own histories of adversity and attachment insecurity that impact their neural responses to their infants, make it difficult to respond in an emotionally attuned manner, and impact the infants' behavior through co-regulation [36–41, 42, 43, 44]. Skills-

based programs may not lead to improvements in the quality of the parent-child relationship (and children's ultimate well-being) due to their lack of attention to children's emotional needs and, perhaps more importantly, their failure to address the root of the matter: mothers' long-standing maladaptive attachment representations and their subsequent competing emotional experiences within the parenting role [45, 46, 24]. Although it remains unknown whether addiction alone or some underlying set of predisposing factors shape the neural, psychological, and behavioral facets of caregiving, it is vital to tailor treatment specifically for this population.

Meeting the Needs of Mothers with Addictions: a Reflective Approach

Researchers have closely examined the unique characteristics of mothers with addictions to identify treatment targets that may enhance care for affected families. Early work in this area documented that, even after controlling for sociodemographic factors (e.g., poverty, race, family composition), maternal addiction uniquely predicted mothers' involvement with their children, but not their limit-setting [5]. In turn, mothers' involvement and warmth was associated with better psychological adjustment and fewer externalizing problems exhibited by their children, whereas limit-setting and control were not broadly predictive of children's positive adjustment [47]. Such findings highlighted the need for interventions to target mothers' positive interest, curiosity, and communication about their children's activities and emotions rather than focus on behavior management. Mothers' experiences in early attachment relationships (e.g., their perception of their own mothers' warmth, empathy, and overprotection) were also, not surprisingly, predictive of their relationships with their own children; notably, however, this relationship was mediated by mothers' level of perceived emotional support from family and friends [6]. Supporting mothers' emotional experiences within the caregiving role could therefore potentially mitigate the negative impact of mothers' attachment insecurity on the next generation.

To best meet the identified needs of mothers with addictions, a growing number of researchers and clinicians have recognized the utility of taking a reflective approach to intervention, grounded in the framework of *mentalization* [11, 48–55]. Mentalization is defined as the ability to make sense of behavior—in oneself and others—in terms of underlying thoughts, emotions, wishes, and intentions [56]. The ability to mentalize for oneself and others is integral to the regulation of one's emotions, behaviors, and relationships. Impairments in mentalization therefore exist at the core of many forms of psychopathology including substance use disorders (SUDs). *Reflective functioning* (RF), or the capacity to mentalize, begins developing within early attachment relationships; young children are more likely to develop sufficient RF when cared

for by sensitive and emotionally attuned caregivers in the context of a secure attachment. In contrast, when a caregiver is unable to hold the child's mind in mind, maintain a balanced mental representation of her child, accurately decipher the child's cues, and sensitively meet the child's needs, there is risk for impairment in the child's development of RF [57, 58].

Given the comorbidity of addiction and adversity [58, 38, 43], the impact of addiction and adversity on maternal neurobiology [30, 32, 42], and the neurobiological underpinnings of maternal RF [59], it is no wonder that mothers struggling with addiction often struggle to mentalize. Studies have shown that mothers with addictions generally show weak RF [7] and demonstrate significantly lower RF than mothers without addictions [60]. This has multigenerational implications given that, for mother-child dyads impacted by maternal addiction, greater maternal RF was related to greater caregiving sensitivity and better child developmental outcomes [61, 62]. Mothers' level of RF also mediated the relationship between their substance use and their children's psychosocial outcomes [63], suggesting RF could be a potent treatment target to ameliorate the transgenerational impact of maternal substance use. With these findings in mind, pioneering work by Dr. Nancy Suchman led to the development of *Mothering from the Inside Out* (MIO), the first scalable, evidence-based parenting intervention designed specifically for mothers in treatment for substance use disorders. Using a framework of mentalization [58, 64–66], MIO supports the improvement of mothers' RF in the context of addiction, adversity, and disrupted attachment.

Mothering from the Inside Out

Treatment Model

MIO is a brief, supportive, individual parenting psychotherapy originally designed for mothers of children under 5 years of age, intended to serve as an adjunct to a mother's substance use treatment. In contrast to many skills-based parenting interventions in which a particular curriculum or set of topics is specified, MIO serves as a guide for facilitating a therapeutic process in which mothers are supported in the development of their skill for mentalizing. MIO allows the work to focus on parenting issues that are most salient to the mother; content therefore inevitably varies from session to session and mother to mother. The therapeutic process is the common denominator across clinicians, mothers, sessions, and treatment settings. All of the mentalizing activity that is encouraged "offline" (e.g., in session) is meant to promote the mothers' spontaneous, continuous, and effective mentalizing efforts "online" (i.e., outside of session, while actively caring for her child). Over time, by engaging in the process of exploring mental states and representations, and thinking reflectively about

relationships, it is expected that the mother's capacity for sensitive caregiving will improve. This process unfolds gradually via five core components (see Figure 1), the combination of which is unique to MIO [67, 68].

The Therapeutic Alliance Within the therapeutic alliance, the clinician *holds the mother in mind*, takes her seriously, respects her perceptions, and serves as a secure base. Often flexibility, acceptance, and tolerance are in high demand given that mothers with addictions may not have experienced those qualities in their early (or current) relationships [6]. MIO thus allows for flexibility and adaptation to the mother, the child, and their unique relationship, circumstances, and context. Mothers may feel unsure of their caregiving abilities due to their involvement with child protective services, comments by medical providers, negative societal views of mothers with addictions, or even what they have been told by their own family members [69, 70]. MIO clinicians therefore anticipate mothers' expectations of judgment and stigma; by leaving space to discuss these experiences and providing a different reparative experience, the MIO clinician lays the groundwork for a secure base in which mentalizing can grow.

The Mentalizing Stance Throughout each session, the clinician maintains a stance characterized by being curious and inquisitive, not-knowing, collaborative, transparent, and child-focused (see Figure 2). The clinician demonstrates genuine interest in the mother's inner world by inviting her to expand on her thoughts, wishes, intentions, and emotions. By acknowledging the opacity of mental states, the clinician helps the mother develop flexibility in her mental representation of her child and recognize that while she cannot know for certain

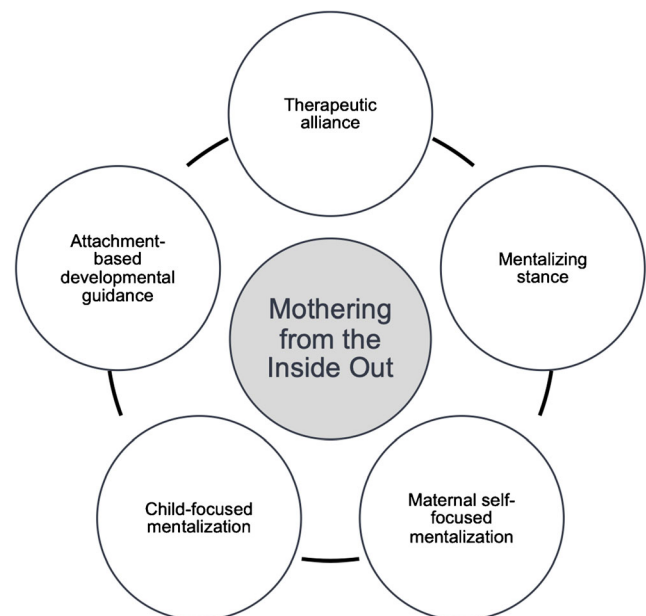


Fig. 1 Treatment components of *Mothering from the Inside Out*

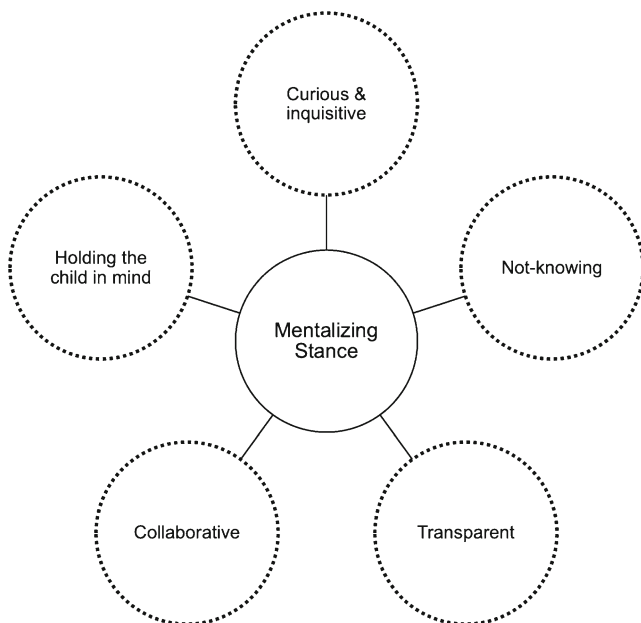


Fig. 2 Components of the *mentalizing stance* held by clinicians delivering *Mothering from the Inside Out*

what her child is thinking, she can make good guesses based on what she knows of her child’s temperament, developmental level, and past experiences. Transparency gives a window into the clinician’s mentalizing process and lends the clinician’s RF to the mother as a form of scaffolding. Collaboration mitigates the mother’s potential anxiety around stigma and power differential; rather than holding an expert role, the clinician makes clear that she is the mother’s partner throughout the therapeutic process and that they will *think together* about caregiving and the stressors that impact the parent-child relationship. Finally, the clinician holds the child in mind, even if the mother is not able to, and relates the conversation back to the child when the mother is emotionally regulated.

Maternal Self-Focused Mentalization While evaluating the efficacy of MIO, Suchman and colleagues documented the presence of two distinct forms of RF: self-focused mentalization and child-focused mentalization. Given that self-focused mentalization was associated with the overall quality of maternal caregiving as well as maternal contingent behavior, it has been suggested that self-focused mentalization could be a critical first step for enhancing the emotional quality of the parent-child relationship in the context of addiction [62]. The clinician is therefore encouraged to help the mother strengthen her capacity to reflect on her own mental states before enhancing her capacity to reflect on her child’s mental states. Clinicians are trained in techniques that facilitate the mother’s ability to reflect upon her own mental states, how they arose, and how they impact her behavior and relationship with her child. This creates supportive space for the mother to approach

and explore her negative affective states within the parenting role, a key treatment target given that mothers’ emotional avoidance mediated the relationship between their self-focused mentalization and caregiving sensitivity [71].

Child-Focused Mentalization The MIO clinician also fosters the mother’s abilities to reflect upon what her child’s behavior is communicating about his or her attachment needs and internal states. With the child’s developmental level in mind, the clinician encourages the mother to wonder what might be running through her child’s mind during stressful situations or interactions and underscores the mother’s efforts to distinguish her own mind from that of her child’s. By playing with various possibilities of what her child may be thinking or feeling, the mother is supported in developing a richer, more emotionally attuned relationship with her child.

Attachment-Based Developmental Guidance Although MIO is not a psychoeducational intervention, at times the clinician provides information about children’s potential emotional needs and strategies that will help support children’s secure attachment. This sensitively timed guidance is provided with the purpose of supporting the mother’s ability to see her child’s mental states more accurately, which aids in her regulation and supports her development of a more balanced representation of her child. Attachment-based developmental guidance is also meant to help the mother understand and appreciate her role in supporting her child’s developing capacities for emotion regulation, particularly in the context of stress and adversity. Many mothers may also benefit from discussion of the developmental dilemmas they may encounter in their roles as mothers, how parenthood changes over time, and what attachment needs of their own may become activated by their children’s ever-changing level of autonomy.

Evidence Base

Efficacy for Mothers with Addictions

Caregiving Following a stage model of clinical intervention research [72], MIO has been examined in pilot, research-clinic efficacy, and community-based efficacy randomized controlled trials. Initial pilot research documented that mothers (with children aged 12–36 months) who participated in MIO showed improvements in their mental representations of their children, as well as improvements in RF, which corresponded with improvements in caregiving behaviors (e.g., sensitivity to child cues, response to child distress, response contingency, cognitive growth fostering, and social-emotional growth fostering) [73]. In subsequent studies of mothers parenting up to 5 years of age, participants were randomized into one of two active treatment conditions: MIO or an active psychoeducational

intervention. Compared to mothers who participated in the psychoeducational intervention, mothers who participated in MIO showed significantly greater improvements in RF, which again were associated with improvements in caregiving behavior. These positive effects were seen immediately post-treatment [74] and were sustained at 6-week [75], 3-month, and 12-month follow-up [76].

Although caregiving behavior is not directly targeted in MIO, mothers who participated in MIO tended to show greater improvements in their caregiving behavior as compared to mothers who participated in the psychoeducational intervention, thereby confirming a central tenet of attachment theory that caregiving behavior is a manifestation of more deeply rooted mental representations and processes [74]. Preliminary analyses of a subset of 84 mothers of children 11 months to 5 years of age in the most recent stage III community-based randomized efficacy trial provide further evidence of this, with mothers who participated in MIO showing improved RF, less negative emotionality and intrusiveness, and greater caregiving sensitivity [77]. These changes appear meaningful and far-reaching, as evidenced by additional preliminary results from the most recent trial indicating that mothers who participated in MIO showed lower rates of child custody loss compared to mothers in the psychoeducational condition.

Substance Use and Psychiatric Outcomes Participation in MIO has also consistently been linked with improvements in mothers' psychosocial adjustment (e.g., decreased depression, anxiety and global psychiatric distress) and decreased risk for relapse [73–76]. Preliminary analyses of the most recent trial show similar trends, with mothers who participated in MIO also demonstrating greater use of relapse prevention supports at follow-up [77]. Moderation analyses in recently published studies reveal that mothers with greater addiction severity benefited most from participation in MIO (in terms of improvements in RF, caregiving behavior, child behavior, and child attachment security), which may inform treatment matching efforts [76]. Overall, the positive psychiatric and addiction outcomes associated with MIO may reflect the underlying improvements in mothers' regulatory capacities resulting from improved RF, in addition to decreases in parenting stress, the experience of being held by a secure base within a therapeutic relationship, and concurrent enrollment in substance use treatment.

Child Outcomes MIO has a ripple effect, touching the lives of the children whose mothers had the opportunity to enhance their capacity for mentalizing. For example, children of mothers who participated in MIO showed greater involvement with their mothers during dyadic interactions as compared to children of mothers who participated in the psychoeducational intervention [76]. Preliminary analyses of the most recent trial

also suggest that children whose mothers participated in MIO showed notable improvements in attachment security at 14-week follow-up [77]. Importantly, whereas mothers demonstrated improved RF, caregiving, and psychiatric outcomes at the conclusion of 12 weeks of treatment, across trials children were generally observed to demonstrate improvements at a more delayed pace. Overall, improvements in child outcomes were minimal immediately post-treatment, with the magnitude of positive effects increasing at follow-up [75, 76]. The lag in children's improvements may reflect the time it takes for children to adjust to and internalize their mothers' improved caregiving.

Treatment Mechanisms In addition to demonstrating MIO's efficacy, the treatment developers also sought to understand which components of MIO were related to improved outcome. Improvement in mothers' RF partially mediated the relationship between improvements in their mental representations of their children and improvements in caregiving behaviors, confirming that maternal RF was a valuable treatment target [73, 74]. Improvements in caregiving sensitivity were related to improvements in children's attachment security, supporting an indirect longitudinal process in which improved maternal RF leads to improved caregiving sensitivity, which ultimately leads to improvement in child attachment security (see Figure 3) [78••]. To fully evaluate the mechanisms of change underlying MIO, researchers also tested how clinicians' adherence to the unique components of MIO (specifically, efforts to foster maternal RF) was associated with improvements in mothers' RF and caregiving behaviors. Multiple examinations of the proposed mechanisms of change indicate that clinicians' efforts to promote mothers' RF, and mothers' subsequent improvement in RF, uniquely predicted improvements in caregiving behavior (see Figure 3) [67, 78••, 79]. Recently published data from the most recent community-based trial revealed that addiction counselors can develop strong enough RF to deliver MIO and can be trained to deliver MIO with good fidelity, thus providing encouraging support for MIO's scalability [80••]. Given the identification of fostering maternal RF as the key mechanism underlying MIO's success, the developers concluded that many of the other treatment parameters could be potentially adapted for implementation in other settings and populations [81••].

Adaptations of MIO in Other Settings, Formats, and Populations

Community Mental Health Attachment theory and mentalization also provide an organizing framework and set of flexible strategies for addressing the dysregulation experienced by parents facing chronic stressors and psychiatric illnesses other than addiction. Stress is related to difficulties in mentalizing [82], and similar to mothers with addictions,

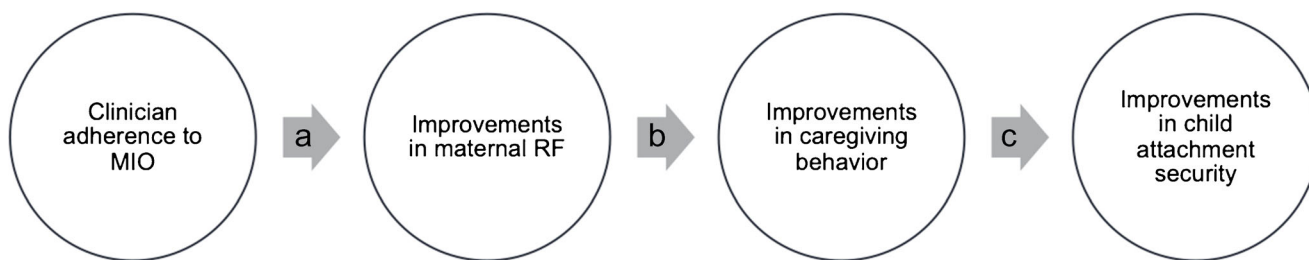


Fig. 3 Mechanisms of change in *Mothering from the Inside Out*. Across three trials, clinician fidelity to unique MIO components (specifically, efforts to foster maternal RF) predicted improvement in maternal RF which predicted improvement in maternal caregiving, which, in turn,

predicted improvement in child attachment security. Standardized correlation coefficients representing effect sizes for paths a, b, and c ranged from .20 to .52 [67, 78]. (MIO, *Mothering from the Inside Out*; RF, reflective functioning)

mothers with psychiatric illnesses also tend to demonstrate impairments in RF [83], suggesting MIO could potentially mitigate children’s risk for psychosocial maladjustment in the context of chronic stress and parental psychopathology. In a pilot test of 17 mothers (of children up to 7 years of age) receiving outpatient psychiatric treatment, community-based mental health clinicians were able to achieve and maintain adequate fidelity to MIO, and MIO was determined to be both feasible (as evidenced by mothers’ completing 70% of sessions) and acceptable (as evidenced by strong therapeutic alliance) [79]. Qualitative findings highlighted the importance of building relationships with community providers and stakeholders, adapting MIO (and its training/supervision) to meet the needs of providers and parents, and training an interdisciplinary team (including psychologists, social workers, and nurse practitioners) [84••]. Quantitative analysis of treatment outcomes were favorable, as evidenced by increases in mothers’ RF (particularly child-focused RF), as well as decreases in parenting stress, depression, and global psychiatric distress [79].

Group Format Others have adapted MIO to be delivered within a group format (for parents of children up to 18 years of age) to address several pragmatic barriers and clinical concerns common in under-resourced communities facing health disparities. Connecting and Reflecting Experience (CARE), the group-based adaptation of MIO, seeks to disrupt the intergenerational transmission of insecure attachment by improving parents’ capacity to mentalize in the context of multiple risk factors, often including social isolation and complex trauma [85••]. In addition to utilizing the five core components of MIO, CARE leverages its group format to offer group members opportunities to collectively reflect upon challenging parent-child moments or other current salient stressors, consider multiple alternate perspectives, share resources, and provide and receive social support. Qualitative findings suggest that shared sociodemographic and parenting experiences within a group-based approach to MIO may facilitate epistemic trust (i.e., experiencing information shared within interpersonal relationships as trustworthy, authentic, and relevant), which opens the door for social learning to

occur, and trauma disclosure—which together provide a rich environment for the development of RF [85••, 86]. Delivering adaptations of MIO in a group format is also beneficial from a public health perspective, enabling clinicians to reach more families in underserved communities, and making efficient use of resources. CARE was also offered virtually throughout the COVID-19 pandemic and will soon be evaluated in conjunction with a digital care management platform as part of a multimodal randomized trial with several vulnerable populations facing health disparities (i.e., caregivers of children with psychiatric conditions, caregivers of children with autoimmune illnesses, and caregivers who are frontline healthcare workers) in an urban healthcare system [87].

Cross-Cultural Adaptations MIO has also demonstrated feasibility, acceptability, and preliminary efficacy with a variety of highly stressed mothers of children up to 13 years of age in the Western Cape of South Africa, including those who had infants in the neonatal intensive care unit, children recovering from burn injuries, or children with intellectual disabilities [81••]. Stakeholders emphasized cultural humility to facilitate partnerships between community providers and the treatment developers, encouraged reflection about cultural beliefs and bias, and adapted MIO to meet the needs of severely under-resourced communities. With this lens, adaptations were made in the format, length, and frequency/intensity of treatment, as well as child age. Similar to CARE, clinicians in this project expressed a desire to deliver MIO within a group format, emphasizing the benefit of holding mothers within a safe, collaborative space with other mothers of similar cultures. In light of the adaptations made (and barriers and facilitators discovered), MIO showed preliminary efficacy as evidenced by improvements in mothers’ RF and caregiving sensitivity and decreases in mothers’ intrusiveness and negative emotionality. By the end of treatment, children studied in this project demonstrated greater involvement and compliance while interacting with their mothers, and dyadic interactions were characterized by greater reciprocity and decreased negativity [81••].

Research in Progress and Future Directions

Now that MIO's feasibility, acceptability, and efficacy have been proven in the research setting, it is poised for evaluation in the "real world." The next phase of MIO clinical trial research should identify strategies for bringing it to scale while continuing to test whether it leads to meaningful improvements for families. A hybrid effectiveness-implementation research design [88] is an ideal approach for characterizing the treatment context while also maximizing external validity and generalizability. Qualitative and quantitative methods should be used to identify barriers and facilitators influencing the implementation of MIO in addiction treatment clinics, as well as the effectiveness of MIO under highly pragmatic conditions. Others have already adapted MIO for use with mothers of older children in order to reach greater numbers of families [81••, 85••]; however, given that the majority of rigorously controlled research studies of MIO include only mothers of children up to age 5, future work should stratify mothers by age of the target child in order to systematically examine treatment outcomes for mothers with older children and determine if some outcomes are specific to parents of younger versus older children. Further, given the overlap of addiction and adversity, and given the challenges with engagement that mothers with addictions demonstrate when referred for trauma-focused treatment, MIO is also being evaluated as an adjunct to trauma-informed dyadic work [89].

Because of the heterogeneity of mothers with addictions, they are likely to access services in a variety of avenues and settings. Mixed methods designs should therefore identify barriers and facilitators to the adoption of MIO in additional community-based treatment settings aside from addiction treatment clinics. For example, across the USA, infants that experience prenatal drug exposure often qualify for early intervention developmental services delivered in the home. Implementation research is therefore being conducted in the early intervention home-visiting setting to ensure MIO is most easily accessible perinatally while maintaining treatment integrity and improving the quality of the mother-child relationship [90••, 91]. In light of the COVID-19 pandemic, it is also vital to study the implementation of MIO via telehealth, with close attention being paid to how a virtual format may impact the therapeutic relationship—a critical treatment component within MIO. Multiple studies are currently examining the delivery of MIO via telehealth in individual format [91] and group format [87]. Finally, to continue ensuring MIO's accessibility, and effective dissemination, scalable training models are currently being developed and evaluated [92].

Next, given the potential role of maternal neurophysiology in the caregiving challenges experienced by mothers with addictions [30•, 31, 32•, 33••, 34, 35••], future research should also examine the impact of MIO on mothers' neural responses to infant cues. The use of event-related potential research

methods within clinical trials of parenting interventions has proven feasible. For example, mothers without addictions who participated in a parenting intervention showed changes in their initial facial structural encoding, as compared to controls [93]. Another study of mothers referred to child protective services demonstrated that participation in an attachment-based intervention was related to greater enhancement of neural responses to infant facial expressions, which was associated with caregiving behavior [94]. Similar methodology may elucidate neural mechanisms of change underlying MIO and inform individualized medicine for mothers with addictions by clarifying maternal brain-behavior linkages.

Finally, researchers may wish to adopt longitudinal, multi-generational research studies examining whether participation in MIO extends beyond improvements in parental reflective functioning and child attachment security, to long-term improvements in family well-being. Given that secure attachment is a protective factor associated with decreased risk of addiction [95–98], it may be worthwhile to study whether the improvement in attachment security seen in children whose mothers participate in MIO is linked with lower risk for developing SUDs in adolescence, adulthood, and parenthood. Recent calls to action highlight the need for parenting interventions that address addiction, adversity, and attachment simultaneously in order to interrupt maladaptive intergenerational cycles [99]; however, it is critical to examine if the evidence for these interventions are long-lasting. If MIO is shown to mitigate risk for the intergenerational transmission of addiction and improve long-term family well-being, there will be further need for effective training and dissemination of this intervention.

Conclusions

Evidence of MIO's efficacy and treatment mechanisms indicates that addressing addiction, adversity, and attachment simultaneously via the improvement of maternal RF generates a positive synergistic effect impacting multiple generations. Overall, by enhancing a mother's ability to reflect on her own and her child's mental states, her caregiving sensitivity improves, ultimately improving her child's attachment security. Given that early exposure to adversity and continuous exposure to contextual stress likely have a cumulative effect on mothers' RF, MIO has proven valuable for mothers with addictions (its originally intended population) as well as mothers who face other chronic stressors. The next phase of MIO research should therefore take an implementation science approach so it may be brought to scale more widely.

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Declarations

Conflict of Interest The authors declare no competing interests.

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Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

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