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## A LONGITUDINAL EXAMINATION OF TODDLERS' BEHAVIORAL CUES AS A FUNCTION OF SUBSTANCE-ABUSING MOTHERS' DISENGAGEMENT

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**ABSTRACT:** As a group, substance-abusing parents are at risk for maladaptive parenting. The association between substance abuse and parenting may result, in part, from parents' emotional disengagement from the parent-child relationship, which makes perceiving and responding to children's cues more challenging. In this study, we examined whether substance-abusing mothers' levels of disengagement from their relationship with their children (ages 2-44 months), operationalized in two different ways using parenting narratives (representational and linguistic disengagement), prospectively predicted children's engagement and disengagement cues during a structured mother-child interaction. Within a sample of 29 mothers, we tested the hypotheses that greater maternal disengagement at Time 1 would predict a decrease in children's engagement and an increase in children's disengagement at Time 2. Results indicated that representational disengagement predicted a decrease in children's engagement cues whereas linguistic disengagement predicted an increase in children's disengagement cues. Results provide partial support for a reciprocal, iterative process in which mothers and children mutually adjust their emotional and behavioral disengagement with one another.

**Keywords:** mother-child interaction, sensitivity, disengagement, behavioral cues, substance abuse

**RESUMEN:** Como grupo, los progenitores que abusan de sustancias se encuentran bajo riesgo de crianzas inadecuadas. La asociación entre el abuso de sustancias y la crianza pudiera resultar, en parte, del estar desconectado emocionalmente de la relación progenitor-niño, lo cual hace de la percepción y respuestas a las señales del niño un mayor reto. En este estudio, examinamos si los niveles de desconexión mostrada por madres que abusaban de sustancias, con relación a su relación con sus niños (edades de 2 a 44 meses), puestas en función de dos diferentes maneras usando las narrativas de crianza (desconexión de representación y lingüística), potencialmente predecía las señales de conexión o desconexión de los niños durante una interacción estructurada madre-niño. Dentro de un grupo muestra de 29 madres, examinamos la hipótesis de que una mayor desconexión materna al momento 1 (T1) predeciría una reducción en la conexión y un incremento en la desconexión del niño al momento 2 (T2). Los resultados indicaron que la desconexión de representación predijo una reducción en las señales de desconexión del niño, mientras que la desconexión lingüística predijo un incremento en las señales de desconexión del niño. Los resultados apoyan parcialmente un proceso recíproco, iterativo en el cual las madres y los niños mutuamente ajustan sus desconexiones emocionales y de conducta con respecto al otro.

**Palabras claves:** interacción madre-niño, sensibilidad, desconexión, señales de conducta, abuso de sustancia

**RÉSUMÉ:** En tant que groupe, les parents toxicomanes sont à risque de parentage maladaptatif. Le lien entre la toxicomanie et le parentage peut résulter, en partie, du désengagement émotionnel des parents de la relation parent-enfant, ce qui rend la perception et la réaction aux signes des enfants plus difficile. Dans cette étude nous avons examiné si les niveaux de désengagement qu'ont les mères toxicomanes de leurs relation avec leurs enfants (âgés de 2 à 44 mois), opérationnalisés de deux manières différentes en utilisant des narrations de parentage (désengagement linguistique et désengagement

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représentationnel), prédisait éventuellement l'engagement des enfants et leurs signes de désengagement durant une interaction structurée mère-enfant. Avec un échantillon de 29 mères nous avons testé l'hypothèse selon laquelle un plus grand désengagement maternel au moment 1 (T1) prédirait une diminution du désengagement des enfants au temps 2 (T2). Les résultats ont indiqué que le désengagement représentationnel prédisait une diminution des signes d'engagement de l'enfant, alors que le désengagement linguistique prédisait une augmentation des signes de désengagement des enfants. Les résultats soutiennent partiellement le besoin d'un processus réciproque et itératif dans lequel les mères et les enfants ajustent mutuellement leur désengagement émotionnel et leur désengagement du comportement l'un avec l'autre.

**Mots clés:** Interaction mère-enfant, sensibilité, désengagement, signes du comportement, toxicomanie

**ZUSAMMENFASSUNG:** Bei Eltern, die missbräuchlich Substanzen konsumieren, besteht ein erhöhtes Risiko für maladaptives Erziehungsverhalten. Der Zusammenhang zwischen Substanzmissbrauch und Erziehungsverhalten könnte zum Teil aus dem elterlichen emotionalen Rückzug bezogen auf die Eltern-Kind-Beziehung resultieren, was wiederum die Wahrnehmung und Reaktion auf die Signale der Kinder erschwert. In dieser Studie untersuchten wir, ob bei substanzmissbrauchenden Müttern der Grad des Rückzugs aus ihrer Beziehung mit ihren Kindern (im Alter von 2 bis 44 Monaten) zukünftige Bindungs- versus Rückzugssignale des Kindes während einer strukturierten Mutter-Kind-Interaktion vorhersagt. Der Grad des mütterlichen Rückzugs wurde anhand von Narrativen bezüglich des Erziehungsverhaltens, die auf 2 unterschiedliche Arten ausgewertet wurden (Repräsentationen und sprachlicher Rückzug), operationalisiert. Anhand einer Stichprobe von 29 Mütter überprüften wir die Hypothese, ob ein stärkerer mütterlicher Rückzug zum Messzeitpunkt 1 (T1) eine Abnahme der kindlichen Bindungssignale und einen Anstieg des kindlichen Rückzugs zum Messzeitpunkt 2 (T2) vorhersagt. Die Ergebnisse zeigten, dass die Bindungsrepräsentationen eine Abnahme der kindlichen Bindungssignale vorhersagten, während der erfasste sprachliche Rückzug einen Anstieg der kindlichen Rückzugssignale vorhersagte. Die Ergebnisse liefern zum Teil einen Beleg für einen gegenseitigen, iterativen Prozess, in dem Mütter und Kinder ihr emotionales und behaviorales Rückzugsverhalten aneinander passen.

**Keywords:** Mutter-Kind-Interaktion, Einfühlungsvermögen, Rückzug, behaviorale Signale, Substanzmissbrauch

抄録: 物質を乱用している親は、不適応な育児をするリスクの高い群である。物質乱用と育児の間の関連は、部分的には、親子の関係性から親が情緒的に離脱disengagementすることに由来する。情緒的な離脱は、子どもの合図に気づき反応することをより困難にさせる。この研究で私たちは、物質乱用の母親が子ども(2から44ヶ月)との関係性から離脱する水準は、構造化した母子相互交流の間の子どもの関わり合いの合図と離脱の合図を、将来予測するかどうかを、調査した。離脱水準は、育児の談話を用いて、二つの異なる方法で操作可能にした(表象上の離脱と言葉の離脱)。29人の母親のサンプルの中で、私たちは時点1(T1)のより大きな母親の離脱は、時点2(T2)の子どもの関わり合いの減少と子どもの離脱の増加を予測するだろう、という仮説を検証した。結果から、表象上の離脱は子どもの関わり合いの合図の減少を予測したのに対し、言葉の離脱は子どもの離脱の合図の増加を予測したことが示された。結果は、母親と子どもが相互に、互いの情緒的および行動的な離脱に適応する、相補的の反復的過程を、部分的に支持する。

**キーワード:** 母子相互交流, 感受性, 離脱, 行動的合図, 物質乱用

摘要: 作為一個群體, 濫用藥物的父母有不良適應的養育之風險。濫用藥物和養育子女之間的關係, 部分原因可能是因為父母的情感從親子關係中抽離, 這使他們對兒童感知和應對線索的認識更具挑戰性。在這項研究中, 我們探討濫用藥物的母親與孩子(年齡2至44個月)關係的抽離, 是否前瞻性地預測兒童在一個結構化的母子互動的參與和抽離。母親與孩子關係抽離用兩種不同母親的敘述(代表性和語言接觸抽離)來定義。在29名母親的樣本裏, 我們測試了較高母體抽離在時間1(T1)預測在時間2(T2)較低兒童的參與和較高的兒童抽離。結果表明, 代表性抽離預測兒童參與線索的下降, 而語言分離則預測兒童抽離線索的增加。研究結果部分支持, 母親和孩子彼此調整自己的情感和行為抽離是一個互惠的、反復的過程。

**關鍵詞:** 母子互動, 敏感度, 抽離, 行為線索, 濫用藥物

ملخص: بشكل عام يمثل الآباء والأمهات المدمنين خطورة على عملية التربية السليمة. التلازم بين تعاطي المواد والأبوة أو الأمومية قد يؤدي إلى كسر الارتباط العاطفي في العلاقي مما قد يؤدي إلى زيادة صعوبة الاستجابة لإشارات الطفل السلوكية. في هذه الدراسة تم اختبار ما إذا كانت مستويات انفصال الأمهات المتعاطيات عن العلاقة مع أطفالهم (من أعمار 2 إلى 44 شهر) قد تتنبأ بالإشارات السلوكية الخاصة بالارتباط أو الانفصال عند الأطفال وذلك أثناء تواصل منظم بين الأم والطفل. ومن خلال عينة من 29 أم قمنا باختبار فرضية أن زيادة مستوى الانفصال لدى الأم في وقت (1) قد يتنبأ بانخفاض في ارتباط الطفل وزيادة في مستوى انفصاليه في وقت (2). وأشارت النتائج أن الانفصال التصوري يتنبأ بانخفاض في الإشارات السلوكية للارتباط لدى الطفل بينما يتنبأ الانفصال اللغوي بزيادة في إشارات الانفصال لدى الطفل. النتائج تقدم دعماً جزئياً لفكرة وجود عملية تبادلية متكررة تقوم الأم والطفل فيها بتوفيق وتعديل الانفصال العاطفي والسلوكي فيما بينهما.

كلمات مفتاحية: تواصل الأم والطفل – الحساسية – الانفصال – الإشارات السلوكية – تعاطي المواد

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As a group, substance-abusing parents are at heightened risk for parenting difficulties. They are less likely than are non-substance-abusing mothers to provide structured environments (Black & Mayer, 1980), use appropriate discipline strategies (Keller, Cummings, Davies, & Mitchell, 2008; Miller, Smyth, & Mudar, 1999; Pears, Capaldi, & Owen, 2007), and meet their children's physical and psychological needs (Bauman & Dougherty, 1983; Coppolillo, 1975). Further, a large body of research has suggested that children of substance-abusing parents are themselves at risk for deleterious outcomes (Bauman & Levine, 1986; Kendal, 1990; McGrath, Watson, & Chassin, 1999; Wilson, McCreary, Kean, & Baxter, 1979). Although some of these outcomes may originate via genetic and biological factors related to in utero exposure to substances, there also is clear evidence that environmental factors (i.e., parenting) play an important role in determining child outcomes (Chassin, Curran, Hussong, & Colder, 1996; Keller, Cummings, & Davies, 2005; Keller et al., 2008; Mayes & Truman, 2002). Understanding environmental influences such as parenting is especially important because they can readily change through intervention.

#### INTERNAL WORKING MODELS OF RELATIONSHIPS AS PREDICTORS OF CAREGIVING BEHAVIOR

Parents' mental models of their close relationships (also referred to as *internal working models*, IWMs; Bowlby, 1980), have been thought to influence their sensitivity as parents (Bowlby, 1982; Main, Kaplan, & Cassidy, 1985; Slade, Belsky, Aber, & Phelps, 1999; Zeanah & Benoit, 1993). Attachment theorists have argued that parents' responsiveness in parent-child interactions help children form their own IWMs of attachment (Bowlby, 1980; Grienberger, Kelly, & Slade, 2005), which in turn have downstream effects on the ways children express their needs for closeness and individuation to their parents (Bowlby, 1982; Fonagy, Steele, & Steele, 1991).

Attachment researchers have used parents' narratives regarding their relationships with their young children as a means of understanding parents' IWMs of caregiving (Zeanah, Larrieu, Heller, & Valliere, 2000). For instance, IWMs regarding caregiving relationships can be assessed using the Working Model of the Child Interview (WMCI; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994). Scores on this measure have been shown to predict young children's attachment security (Huth-Bocks, Levendosky, Bogat, & Von Eye, 2004; Zeanah et al., 1994), even when assessed during pregnancy (Benoit, Parker, & Zeanah, 1997).

Attachment theorists have argued that an individual's caregiving IWM is linked to their attachment organization, as these relationship schemas develop through interactions with the individual's own caregivers (Bowlby, 1982). The most common form of adult attachment insecurity with respect to individuals' own caregivers is referred to as dismissing/avoidant attachment (hereafter referred to as *dismissing attachment*), which is characterized by a persistent pattern of turning away one's attention from attachment-related thoughts and emotions (Cassidy, 1994; Dozier & Kobak,

1992; Main, 2000), or *disengagement*, with respect to attachment relationships. Research has supported that disengagement among dismissing adults also translates to the realm of parenting, although some studies have found that dismissing or disengaged<sup>1</sup> parents are relatively unaware of their children's emotional experiences, miss children's signals (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997; Huth-Bocks et al., 2004; van IJzendoorn, 1995), and are less likely to respond in a sensitive way to their children's needs (Bell & Ainsworth, 1972; Sokolowski et al., 2007; Stern, Borelli, & Smiley, 2015).

Parental rejection of children's needs in turn may foster negative interaction patterns in which the children fail to elicit or accept parents' help, thus discouraging parents from responding to their children (Ainsworth & Bell, 1974; Ainsworth, Blehar, Waters, & Wall, 1978; Benoit, Zeanah et al., 1997). Disengagement is one interactional pattern for which substance-abusing parents may be particularly at risk of developing with their children (Brooks, Zuckerman, Bamforth, Cole, & Kaplan-Sanoff, 1994; Suchman, DeCoste, Leigh, & Borelli, 2010). In particular, substance abuse may reduce the brain's neural system responses to infant's emotional cues (Landi et al., 2011), which may make parents with substance-use disorders more likely than are parents who do not abuse substances to be disengaged vis-à-vis their relationship with the child (Mayes & Truman, 2002; Pears et al., 2007).

#### CHILDREN'S MODES OF SIGNALING ATTACHMENT NEEDS

According to attachment theory, parent-child interactions are thought to be iterative processes in which input from one member of the dyad affects the behavioral output from the other member (Ainsworth & Bell, 1974; Sumner & Spietz, 1994). In other words, both children and parents contribute to the quality of their interactions (Bornstein, Tamis-LeMonda, Hahn, & Haynes, 2008; Brazelton, Koslowski, & Main, 1974). Young children communicate primarily using cues (nonverbal signaling behaviors), which can be classified as expressing their wish to engage or disengage (Sumner & Spietz, 1994). Engagement cues are thought to signal the child's desire to engage with or get attention from the parent and include behaviors such as smiling, reaching toward the parent, and making eye contact with the parent (Barnard & Sumner, 2002). Disengagement cues are thought to communicate a child's need for physical distance or separation from the parent (Barnard & Sumner, 2002).

For a young child, cues are his or her main form of communicating, and the parent's response to the child's cues can alter the child's cueing in future interactions with the parent (Bell & Ainsworth, 1972) as well as the child's IWM (Bell & Ainsworth, 1972; Bornstein et al., 2008). Children repeatedly exposed to parents' rejection may respond by increasing their own disengagement cues (Bell & Ainsworth, 1972; Sumner & Spietz, 1994),

<sup>1</sup>The WMCI disengaged classification and scale most strongly resembles the dismissing classification on the Adult Attachment Interview (George, Kaplan, & Main, 1984; Sokolowski, Hans, Bernstein, V.J., & Cox, 2007).

which could communicate children's refusal to interact or connect with the rejecting parents. Children may learn that relying on disengaged parents to get their emotional and physical needs could be dangerous and therefore may attempt to separate even further from their parents. Indeed, Bell and Ainsworth (1972) found that mothers who were less responsive to their crying infants early in their first year had children who cried more later on. A second possible outcome is children may decrease the amount of engagement cues they display over time, as engaging with a disengaged parent might be frustrating and painful (Ainsworth et al., 1978; Weinfield, Sroufe, Egeland, & Carlson, 2008). In turn, a child who exhibits fewer engagement and more disengagement cues over time would appear to desire less closeness from the parent, making it even less likely that a disengaged parent would make attempts to get closer to the child. Stated simply, this process of mutual adaptation between parent and child across interactions is thought to underlie the development of attachment patterns in young children (Ainsworth, 1979; Bowlby, 1973).

To date, no studies have explored the subtle changes in children's behavior that are related to parents' disengagement. A primary aim of this investigation is to examine microbehavioral changes in children's engagement and disengagement that may happen as a result of substance-abusing mothers' disengagement. Specifically, we examine whether two possible indicators of maternal disengagement prospectively predict changes in young children's behavioral signals of attachment needs.

### ASSESSING PARENTS' DISENGAGEMENT WITH THEIR CHILDREN

Parental disengagement from the parent-child relationship can be measured in many ways. In the current study, we draw upon two of the most dominant methodological traditions within psychology to measure disengagement—narrative coding and linguistic analysis—to assess representational and linguistic metrics of disengagement, respectively.

Parenting narratives can be coded for the degree to which the parent emotionally disengages from her or his relationship with the child. The WMCI scales describe parents' representations of the child and the parent-child relationship based on a combination of the content of the interview and the parent's affective tone during the interview. In this system, *Disengaged* representations are emotionally cool and detached, and there is a degree of indifference toward the child. Parents who score high on the Disengaged scale may not recognize their children's internal experiences, or if they recognize them, they do not value them. Oftentimes, these parents also dismiss their impact as caregivers (Benoit, Zeanah et al., 1997; Zeanah & Benoit, 1993). High scores on the Disengaged scale indicate evidence of *representational disengagement* from the relationship.

We also assess *linguistic disengagement* using a complementary method of textual analysis. Researchers examine relationship narratives at microbehavioral levels by analyzing the words people use in this context (Borelli, Sbarra, Mehl, & David, 2011;

Borelli, West, DeCoste, & Suchman, 2012), arguing that word choice reveals subtle, but meaningful, information about people's psychological states and traits, as well as their relational functioning (Pennebaker, Francis, & Booth, 2001). One linguistic construct of particular relevance to disengagement is the *Verbal Immediacy* composite score; a factor analytically derived variable based on the standardized Linguistic Inquiry and Word Count categories (LIWC; Pennebaker et al., 2001) of first-person singular (*I, me, my*), discrepancy words (e.g., *should, would*), present-tense verbs, inverse scores for articles (*a, the*), and words comprised of six or more letters (Biber, 1988). Texts high in immediacy are concrete, personal, involved, and experiential and focus on the present whereas texts low in immediacy are more abstract, impersonal, detached, and rational in tone (Pennebaker & King, 1999). Low levels of immediacy (referred to as *high psychological distancing*) may occur when people want emotional distance from an experience that may exceed their regulatory capacity (Cohn, Mehl, & Pennebaker, 2004); consistent with this theorizing, Borelli et al. (2011; Borelli et al., 2013) found that dismissing children and adults had lower immediacy (more distancing) when discussing their relationships with their primary caregivers. Therefore, low levels of immediacy (more psychological distancing) constitutes our measure of linguistic disengagement.

### CURRENT STUDY

Our primary aim in this study is to examine how two forms of maternal disengagement from the mother-child relationship prospectively predicts children's behavioral cues of engagement and disengagement over a 5-month period. Although we are interested in the association between parental disengagement and children's behavior writ large to restrict statistical noise in a small sample, in the current study, we restrict our focus to mothers. Further, we examine our hypotheses among a sample of substance-abusing mothers enrolled in a treatment study due to the fact that they are at greater risk for poor parenting practices (Bauman & Dougherty, 1983; Wasserman & Leventhal, 1993) as well as our desire to examine factors that appear untouched by psychotherapeutic parenting programs for mothers with substance-abuse histories and children's cues in future interactions (Bell & Ainsworth, 1972; Suchman, DeCoste, Castiglioni et al., 2010). Specifically, in the original study of the current sample, researchers found that at postassessment, mothers in the treatment condition increased in caregiving sensitivity as well as in some representational domains of the WMCI; however, there were no changes in representational disengagement or child behavior (Suchman, DeCoste, Castiglioni et al., 2010). Therefore, in this investigation, we combine the experimental and control groups, using treatment as a covariate, to examine the relationship between these two areas.

We propose that both representational and linguistic measures of maternal disengagement will predict changes in child behavioral engagement over time. With respect to representational disengagement, we hypothesize that higher scores on the Disengaged scale of

the WMCI will predict (H1a) increases in child disengagement cues and (H1b) decreases in engagement cues over time. Similarly, we hypothesize that greater linguistic disengagement—psychological distancing on the Parent Development Interview (PDI; Slade, Aber, Berger, Bresgi, & Kaplan, 2003)—will predict (H2a) increases in child disengagement cues and (H2b) decreases in engagement cues over time.

## METHOD

### Participants

The data presented here were collected as part of a randomized controlled clinical trial testing the efficacy of the Mothers and Toddlers Program (MTP), a parenting intervention for substance-abusing mothers (the results of which are not presented here; see Suchman, DeCoste, Castiglioni et al., 2010; Suchman, DeCoste, McMahon, Rounsaville, & Mayes, 2011). In the original sample, 56 mothers consented to participate, and 47 completed baseline measures. For this study, we used data from a subset of mothers. The subsample did not differ from the full sample on any demographic characteristics or baseline measures. Twenty-nine mothers completed parenting interviews (WMCI and PDI) at baseline and the parent–child interaction task at baseline and post. The mothers were between 20 and 42 years ( $M = 30.34$ ,  $SD = 6.14$ ), and the children's ages ranged from 2 to 44 months ( $M = 19.83$ ,  $SD = 12.25$ ) at baseline. In the current study, treatment condition was included as a covariate, but was unrelated to child cueing behavior at pre- or post-treatment.

### Procedure

Participant recruitment occurred at two outpatient treatment programs in an urban area. The mothers were referred through their primary substance-abuse counselors or were recruited by the research staff. Upon referral, a trained research assistant screened the mothers to assess eligibility. To participate, mothers had to have one child between birth and 48 months, the child could not show any signs of developmental delays, and the mothers had to be enrolled in outpatient substance-abuse treatment. Mothers were excluded from participation if they were actively suicidal, homicidal, severely cognitively impaired, not enrolled in substance-abuse treatment, or not fluent in English.

Mothers who met the criteria were asked to complete informed consent, then they began their baseline assessments, which took place over a 4-week period and included the WMCI, the PDI, and a standardized parent–child interaction task, The Nursing Child Assessment Satellite Training (NCAST; Barnard & Eyres, 1979). At the end of the 4-week period, mothers began a 12-week program as part of the experimental condition, the MTP, or the control condition, Parental Education (PE) (for more information, see Suchman, DeCoste, & Mayes, 2009). At the post-treatment assessments, occurring on average 150.40 days ( $SD = 86.43$ ) following baseline, dyads completed another NCAST task.

### Measures

*Representational disengagement.* Each mother's mental representation of her relationship with her child was assessed using the WMCI (Zeanah & Benoit, 1993). The WMCI is a semistructured, 1 1/2-hr interview that asks mothers to speak about their perceptions of their children and the mother–child relationship (Benoit, Zeanah et al., 1997). Questions are designed to elicit information used to classify the mother's perception and personal experience of her child as an individual (Zeanah et al., 1994).

Broadly speaking, the WMCI scales can be divided into content and affective tone scales, which are then coded on 5-point scales (1 = *not at all*, 3 = *moderate*, 5 = *extreme*). The content scales review items are thought to characterize the most important qualities of a mother's working model of her child (Zeanah & Benoit, 1993). The affective tone scales assess major affective themes in the interview (for more information, see Benoit, Zeanah et al., 1997). Coders are instructed to focus less on what the mother is saying about the child and more on the mother's expressed or apparent emotional state during the interview. High scores on the Disengaged scale derive from low scores on the content scales of *Richness of Perception*, *Openness to Change*, *Acceptance*, *Intensity of Involvement*, and *Caregiving Sensitivity*, and high scores on the affective tone scale, *Indifference*. Scores for the Disengaged scale range from 1 to 5, with greater scores equaling greater disengagement. In this study, a psychologist who was trained to reliability by the PI coded the interviews, with high interrater reliability (interclass correlations  $\geq .50$  for items of 15 independently coded protocols).

*Linguistic disengagement.* The mother's emotional experience of parenting her child was assessed using the PDI (Slade et al., 2003). This semistructured, 1-hr interview is meant to elicit stories from the mother about some of the commonly occurring and emotionally challenging aspects of parenting. All interviews were recorded and transcribed. Following transcription, research assistants edited the PDIs, making all adjustments consistent with the requirements of the LIWC format (Pennebaker et al., 2001). Separate research assistants trained in LIWC editing protocol reviewed the modified PDIs two additional times. The double- and triple-checked PDIs were then analyzed using LIWC. The software uses an internal dictionary comprised of 74 standardized linguistic (e.g., personal pronouns) and psychological (e.g., positive and negative word) dimensions. Each word of the texts is compared to this dictionary to calculate the percentage of words used by category (e.g., percentage of words that were personal pronouns) to the total words used in the interview. For this study, only the immediacy index was used (for an example of a similar word-selection procedure, see Rodriguez, Holleran, & Mehl, 2010).

*Parent–child interaction.* The NCAST (Barnard & Eyres, 1979) is a standardized, parent–child interaction assessment tool. Although originally developed for children ages birth to 36 months, in recent years investigators have used the NCAST with slightly older

children (Bohr, Halpert, Chan, Lishak, & Brightling, 2010). The 73 binary-item tool is used in observations to rate the quality of these interactions. Parents choose a task (e.g., stacking blocks, stringing beads, holding a rattle, etc.) from a list of tasks organized by level of difficulty. The teaching session is meant to last for 5 min and is recorded with cameras capturing split-screen views of both members of the dyad. During the teaching task, the mother and child are both rated on various behaviors.

Traditionally, the NCAST is coded using six subscales. The mother's subscales assess responsiveness to the child's behavioral cues and to the child's distress as well as the mother's social interactions with the child and her attempts to motivate the child. The subscales for the child's behavior assess his or her ability to display clear cues for the mother to read and evaluate the child's response to the mother's behaviors. Importantly, these scales do not assess the frequency with which the child uses particular cues but rather whether the child ever uses cues.

For this study, a reliable NCAST rater (first author) trained by an NCAST-certified instructor (third author) coded each teaching session for the unique cues that the child displayed during the interaction. The specific cues were taken from the NCAST Caregiver/Parent-Child Interaction Teaching Manual. The manual lists eight subtle engagement cues (e.g., brow raising, facial brightening), 11 potent engagement cues (e.g., mutual smiling, giggling), 43 subtle disengagement cues (e.g., gaze aversion, tongue show), and 22 potent disengagement cues (e.g., pulling away, whining). Although certified NCAST coders are trained in assessing child cues, the NCAST Teaching Scales themselves do not include a standard protocol for scoring individual cues; the purpose of this study was to create an inventory of child cues in an attempt to create a complete picture of the behavioral signals from the child. The coder created the inventory by making note of each of the different cues used by the child, the number of times each cue was used by the child, and the length of time the child used each cue. The inventory highlights nuanced changes in child cueing within the mother-child interaction. To our knowledge, this is a novel use of the NCAST taxonomy of cues, therefore, a second coder was trained in the coding system to check reliability. The second coder rated 20% of the NCAST videos using the inventory system, and interrater reliability was excellent for both engagement and disengagement cues (.94 and .93, respectively). To simplify the inventory of cues, we divided the total number of child engagement cues (subtle and potent) by the length of the interaction in seconds, and divided the total number of disengagement cues (subtle and potent) by total seconds.

**Data analytic plan.** To evaluate the directional hypotheses about the longitudinal association between maternal disengagement and child engagement/disengagement cues, we conducted four separate hierarchical linear regressions. Because the sample size was very small, we elected only to include essential covariates (treatment condition, baseline scores of dependent variables, child age) in the analyses presented here. However, a supplemental set of analyses in which we did include the covariates (mother age and child

**TABLE 1.** Sample Characteristics ( $N = 29$ )

	<i>M (SD) or Percentage</i>	
Mother's Age	30.34 (6.14)	
Years of Maternal Education	12.38 (1.24)	
No. of Children	1.76 (0.91)	
Child Age (months)	19.83 (12.25)	
Male Child	58.6%	
Marital Status		
Never Married	51.7%	
Cohabiting	17.2%	
Married	17.2%	
Separated or Divorced	13.8%	
Race/Ethnicity		
Caucasian	79.3%	
African American	17.2%	
Hispanic Origin	3.4%	
Primary Substance		
Opiate	72.4%	
Cocaine	13.8%	
Alcohol	6.9%	
Cannabis	6.9%	
Methadone-Maintained	68.1%	
Used a Substance During Baseline Month	24.4%	
Representational Index (WMCI)		
Disengaged Scale <sup>a</sup>	2.71 (1.24)	
Linguistic Index		
Disengagement (Verbal Immediacy) <sup>b</sup>	-.01 (.58)	
Toddler Cues (total per second)	Baseline <i>M (SD)</i>	Post <i>M (SD)</i>
Behavioral Disengagement Cues	.48 (.26)	.40 (.23)
Behavioral Engagement Cues	.26 (.15)	.28 (.14)

<sup>a</sup>Clinical cutoff = 3.0.

<sup>b</sup>Low scores = high disengagement.

gender) suggested that the pattern of effects remained the same with the inclusion of covariates, although the *p* value increased slightly.

## RESULTS

Table 1 reports means and standard deviations for all study variables. Average scores on the Disengaged scale fell close to clinical cutoffs for the WMCI. Bivariate correlations revealed that child age was positively associated with total engagement cues per second at baseline, and that maternal age was negatively associated with total disengagement cues per second at post (see Table 2).

### ***H1: Prospective Association Between Representational Disengagement and Child Cues***

We conducted two regression analyses predicting Time 2 child cues from Time 1 representational disengagement, measured using the Disengaged scale (see Table 3). After controlling for covariates (treatment condition, Time 1 cues, child age), we found that greater representational disengagement did not significantly predict an

**TABLE 2.** Correlation Matrix for Key Variables

Variable	1	2	3	4	5	6	7
1 Child Age	–						
2 Mother Age	.44*	–					
3 Time 1 Disengagement Cues/s <sup>a</sup>	-.33	-.29	–				
4 Time 2 Disengagement Cues/s <sup>a</sup>	-.31	-.38*	-.54**	–			
5 Time 1 Engagement Cues/s <sup>a</sup>	.49**	.28	-.40*	-.48**	–		
6 Time 2 Engagement Cues/s <sup>a</sup>	.19	.33	-.34	-.20	.55**	–	
7 Disengaged (WMCI)	-.13	-.14	.25	.18	-.05	-.35	–
8 PDI Verbal Immediacy	-.25	.08	.35	-.16	-.16	-.26	.16

WMCI = Working Model of the Child Interview; PDI = Parent Development Interview.

<sup>a</sup>Child disengagement/engagement coded from the NCAST.

\**p* < .05 (two-tailed). \*\**p* < .01.

increase in child disengagement cues at Time 2 (H1a). In support of our H1b, the relationship between representational disengagement and child engagement cues was significant such that higher scores on the WMCI Disengaged scale, or greater representational disengagement, predicted a decrease in child engagement cues at Time 2,  $\beta = .11, p = .05$ . The  $\Delta R^2$  was equal to .11, which is defined as a medium to large effect size.

**H2: Prospective Association Between Linguistic Disengagement and Child Cues**

To test linguistic disengagement, assessed using the Verbal Immediacy score, as a predictor of child engagement, we conducted two regression analyses (see Table 4). After controlling for covariates, we found that lower verbal immediacy, or greater linguistic disengagement, significantly predicted an increase in child disen-

gagement cues at Time 2,  $\beta = -.42, p = .02$ ) in support of H2a. The  $\delta R^2$  was equal to .15, which is defined as a large effect size. However, a second regression predicting child engagement cues (2b) failed to find a significant association.

**DISCUSSION**

Our goal was to investigate the reciprocal nature of two forms of disengagement in parent–child relationships in a small sample of substance-abusing mothers. We examined microbehavioral changes in children’s communication during interactions with their substance-abusing mothers as a function of maternal disengagement as evident during mothers’ interviews about their relationships with their children. Previous work has suggested that maternal disengagement from the parent–child relationship may lead to negative outcomes such as attachment insecurity (Benoit, Parker et al., 1997) and clinical problems in children (Benoit, Zeanah et al., 1997; Crowell & Feldman, 1988; Zeanah & Benoit, 1993). In addition, substance-abusing parents are at risk for maladaptive parenting strategies, one of which may be disengagement (Gottwald & Thurman, 1994). It was our intention to investigate whether maternal disengagement vis-à-vis the parent–child relationship predicts deterioration in child behavior during dyadic interactions.

Using the Disengaged scale from the WMCI, we tested representational disengagement as a predictor of changes in child cueing behavior. In support of our hypotheses, we found that greater representational disengagement predicted decreases in child engagement from Time 1 to Time 2—when representational disengagement was high, child engagement decreased over time. Perhaps in the case of mothers with high representational disengagement, their children’s previous attempts to engage may have been ignored or disregarded, making it difficult for the child to create a regular pattern of engagement with the mother (Sumner & Spietz, 1994). Our findings suggest that disengagement on the

**TABLE 3.** Hierarchical Regression Examining Representational Disengagement and Child Cues Over Time

	Dependent Variable					
	Time 2 Disengagement			Time 2 Engagement		
	<i>B</i>	<i>SE</i>	CI	<i>B</i>	<i>SE</i>	CI
Step 1						
Treatment Condition	-.04	.08	[-0.21, 0.14]	.03	.05	[-0.07, 0.12]
Time 1 Behavior	.38**	.17	[0.03, 0.72]	.52***	.17	[0.17, 0.87]
Child Age	.00	.00	[-0.01, 0.01]	.00	.00	[-0.01, 0.00]
Step 1 $\delta R^2$	.29**			.28**		
Step 2						
Disengaged scale (WMCI)	.02	.04	[-0.06, 0.09]	-.04*	.02	[0.00, 0.11]
Step 2 $\delta R^2$	.01			.11*		

WMCI = Working Model of the Child Interview; CI = 95% confidence interval; Time 1 Behavior = Time 1 engagement or disengagement cues.

\**p* = .05. \*\**p* < .05. \*\*\**p* < .01.

**TABLE 4.** Hierarchical Regression Examining Maternal Linguistic Disengagement and Child Cues Over Time

	Dependent Variable					
	Time 2 Disengagement			Time 2 Engagement		
	<i>B</i>	<i>SE</i>	CI	<i>B</i>	<i>SE</i>	CI
Step 1						
Treatment Condition	-.03	.07	[-0.17, 0.12]	-.01	.05	[-0.10, 0.09]
Time 1 Behavior	.53**	.15	[0.21, 0.84]	.53**	.18	[0.165, 0.90]
Child Age	-.04	.01	[-0.01, 0.00]	.00	.00	[-0.01, 0.00]
Step 1 $\delta R^2$	.29*			.27*		
Step 2						
Verbal Immediacy	-.16*	.07	[-0.30, -0.03]	-.05	.00	[-0.13, 0.04]
Step 2 $\delta R^2$	.15*			.04		

CI = 95% confidence interval, Time 1 Behavior = Time 1 engagement or disengagement cues, \* $p < .05$ . \*\* $p < .01$ .

part of the mother may confer risk for decreasing engagement on the part of the child. Our hypotheses regarding representational disengagement and increases in child disengagement cues were not supported.

In addition, we examined mothers' linguistic disengagement from their children as a predictor of changes in children's behavioral cues over time. These analyses showed that there was no significant relationship between linguistic disengagement and child engagement cues; however, linguistic disengagement was prospectively associated with an increase in child disengagement cues over time. These findings suggest that when a mother demonstrates linguistic signs of disengagement from her emotional experience of parenting, her child may increase his or her use of behavioral disengagement cues in parent-child interactions.

### Conclusion

Our findings highlight important patterns of the prospective associations between maternal and child disengagement, and we believe that our results reveal important directions for future research. Maternal representational disengagement predicted decreases in child engagement while maternal linguistic disengagement predicted increases in child disengagement. This pattern of results suggests that there could be multiple forms of disengagement that are differentially associated with child behavioral cues. It might be that the coder-rated, representational disengagement is related to an overall sense of disengagement with or apathy toward the parent-child relationship whereas linguistic disengagement is a marker of psychological distancing from the emotional experience of parenting or of the child. Future lines of research should explore this distinction. If there is a difference between mothers who demonstrate representational disengagement and mothers who show linguistic disengagement, then the changes in children's behavior may speak to how different types of maternal disengagement translate into parenting.

Mothers who are more globally disengaged (high representational disengagement) may be difficult to engage in parent-child

interactions, which might mean that children may not display changes in disengagement cues because they rarely need to communicate the need for space. Instead, they may stop trying to engage the mother as those cues are overlooked or ignored. On the other hand, mothers who are disengaged from the emotional experience of parenting (high linguistic disengagement) may be engaged with children during interactions, but in an insensitive way. The children may not decrease their bids for engagement because their mothers are available and responsive to these bids; however, children may increase their disengagement cues because these mothers need more frequent and potent information about the children's desire for rest and space. In sum, representational disengagement could be a more global form of disengagement that permeates all interactions whereas linguistic disengagement may be a form of disengagement specific to emotion, which could emerge in times of child distress. Then it may be the case that children of representationally disengaged mothers may need to utilize different cues than do children of linguistically disengaged mothers because their mothers' disengagement affects their interactions differently. Although intriguing, the findings are preliminary, and these speculative interpretations raise more questions about the nature of these constructs and their association with child interactive behavior. Future studies should attempt to further examine multiple indices of maternal disengagement and their relation to child behavior.

Another future direction of interest would involve examining whether other aspects of parenting similarly predict changes in children's cueing behavior. For instance, parental reflective functioning, the parent's capacity to understand the nature of mental states (thoughts, feelings) in the self and the child, has been implicated as a precursor to parenting sensitivity (Slade, 2005; Suchman, DeCoste, Leigh, & Borelli, 2010), and low levels of parental reflective functioning are associated with avoidant attachment in school-aged children (Borelli, St. John, Cho, & Suchman, 2015). It would be interesting to expand upon the results of the current study and to identify whether lower levels of parental reflective functioning similarly predict changes in children's cueing

behavior, and whether parents' disengagement mediates the association between low parental reflective functioning and child cueing.

The findings presented here should be interpreted in the context of the study's limitations. First, it was a small, self-selected sample of mothers who sought help with parenting and were enrolled in substance-abuse treatment, which begs replication in larger, non-treatment-seeking samples. The observed effects were large, and it is possible that several effects that did not reach statistical significance would do so if examined in larger samples. In addition, prenatal drug-exposure data were not collected as a part of baseline measures, which precludes us from being able to assess the impact of prenatal exposure on children's cueing behavior in general, or on the link between maternal disengagement and child cueing behavior. Importantly, here we examined changes in children's behavior over time, reducing the likelihood that our findings are better explained by prenatal exposure, but future research with assessments of in utero drug exposure would be better positioned to rule out this potential confound. In addition, in this study we assessed maternal and child disengagement using dominant methods in the field, although importantly, these are not the only ways of assessing disengagement. For instance, we did not measure maternal disengaging *behavior*, which also may be linked to children's cueing behavior. Future research can build on our study by investigating a broader range of parent-child behaviors using this transactional lens. In addition, mothers desiring a parenting intervention already may be less disengaged toward their children than are other substance-abusing mothers, which limits our ability to generalize to mothers whose engagement is lower. Future research should include mothers who are not in treatment and/or have not explicitly sought help with their parenting.

Limitations notwithstanding, the findings of this study have important implications for future research. Maternal disengagement is related to subtle changes in child cueing behavior. Before language develops, behavioral cues are the only form of communication a child has with his or her caregiver (Sumner & Spietz, 1994). Therefore, studying behavioral communication has the potential to offer insight into subtle aspects of mother-child interactions. To our knowledge, this is the first published study to explore the microbehavioral changes that occur over time in children as they relate to maternal disengagement. Through future examination of these processes, our findings may inform treatment interventions designed to help substance-abusing mothers engage with the parent-child relationship to enhance their interactions with their children.

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