
ATYPICAL MATERNAL BEHAVIOR TOWARD FEEDING-DISORDERED INFANTS BEFORE AND AFTER INTERVENTION

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ABSTRACT: The display of atypical behaviors and disrupted communication during parent–infant interactions, as assessed by the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE), has been linked to disorganized infant attachment, which, in turn, has been linked to psychopathology. The present study examined the usefulness of the AMBIANCE as an indicator of the efficacy of two brief interventions in reducing atypical behaviors and disrupted communication during play interactions. Twenty-eight mother–infant dyads participated (14 per intervention). All infants had feeding problems. One intervention, Interaction Guidance, focused on training caregivers to respond sensitively to their infants (play-focused intervention). The other intervention focused on training mothers to use new feeding techniques (feeding-focused intervention). Results showed a significant decrease in AMBIANCE scores in the play-focused group from pre- to postintervention, but not in the feeding-focused group. There was a significant decrease in the level of disrupted communication from pre- to postintervention sessions in the play-focused group but not in the feeding-focused group. 73% of mothers from the play-focused group and 17% of mothers from the feeding-focused group initially classified as “disrupted” attained a classification of “nondisrupted” at the postintervention session. Some limitations of the study include small sample size, differences in timing of assessment for each intervention, and use of samples of convenience. Nonetheless, these findings provide preliminary evidence both of the useful-

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ness of AMBIANCE as an instrument for assessing clinical efficacy and the efficacy of Interaction Guidance.

RESUMEN: El hecho de mostrar conductas atípicas y alteraciones en la comunicación durante las interacciones entre el infante y su madre, tal como se evalúa por medio de AMBIANCE (el instrumento para evaluar y clasificar las conductas maternas atípicas), ha sido relacionado con la desorganizada unión afectiva del infante, lo cual, a su vez, ha sido relacionado con la psicopatología. El presente estudio examina la utilidad de AMBIANCE como indicador de la eficacia de dos intervenciones breves para reducir conductas atípicas y alteraciones en la comunicación durante las interacciones de juego. Participaron veintiocho díadas de madre-infantes (14 en cada proceso de intervención). Todos los infantes tenían problemas de alimentación. Una intervención, la guía de la interacción, se concentró en entrenar a quienes prestan cuidado en cómo responder sensiblemente a sus infantes (intervención centrada en el juego). La otra intervención se concentró en entrenar a las madres en cómo usar nuevas técnicas de alimentación (intervención centrada en la alimentación). Los resultados demostraron una significativa reducción en los puntajes de AMBIANCE en el grupo que estaba centrado en el juego, desde le pre-intervención hasta la post-intervención., pero no así en el grupo centrado en la alimentación. Se dio asimismo, una significativa reducción en el nivel de las alteraciones comunicativas desde la pre-intervención hasta la post-intervención en el grupo centrado en el juego, pero no en el grupo centrado en la alimentación. 73% de las madres en el grupo de juego y 17% de las madres en el grupo de alimentación, inicialmente clasificadas como “alteradas” lograron una clasificación de “no-alteradas” al momento de la sesión de post-intervención. Entre algunas limitaciones del estudio se puede mencionar las diferencias en cronometrar la evaluación en cada intervención para un pequeño grupo de muestra, y el uso de muestras de conveniencia. No obstante, estos hallazgos proveen evidencia preliminar tanto acerca de la utilidad de AMBIANCE como instrumento para medir la eficacia clínica, como la eficacia de la guía de la interacción

RÉSUMÉ: Les manifestations de comportements atypiques et de ruptures de communication lors d'interactions parents-enfant, mesurées par un instrument d'évaluation et de classification des comportements maternels atypiques (AMBIANCE, Atypical Maternal Behavior Instrument for Assessment and Classification), a été précédemment mis en rapport avec l'attachement désorganisé chez le jeune enfant, lequel est à son tour lié à la survenue de la psychopathologie. La présente étude examine l'utilité de AMBIANCE comme indicateur de l'efficacité de deux types d'interventions brèves visant à réduire les comportements atypiques et les ruptures de communication pendant des interactions lors du jeu. 28 dyades mères-enfant ont participé à l'étude (14 par type d'intervention). Tous les enfants avaient des difficultés alimentaires. Une des interventions, du type de la guidance interactive, visait à entraîner les mères à répondre avec sensibilité aux besoins de leur bébé (intervention centrée sur le jeu). L'autre intervention visait à entraîner les mères à l'usage de nouvelles techniques d'alimentation (intervention centrée sur l'alimentation). Les résultats ont montré une diminution significative des scores à l'AMBIANCE dans le groupe centré sur le jeu, entre l'avant et l'après intervention, mais non dans le groupe de l'intervention centrée sur l'alimentation. Il existait une diminution significative des ruptures de la communication à la suite de l'intervention dans le groupe centré sur le jeu, mais pas dans le groupe centré sur l'alimentation. 73% des mères du groupe-jeu et 17% des mères du groupe-alimentation, initialement classées comme « à communication rompue » ont obtenu un classement dans la catégorie « à communication non rompue » à l'évaluation post-intervention. Cette étude est limitée par la faible différence dans le moment de l'évaluation des échantillons pour chaque type d'intervention, et par l'usage d'échantillons tout-venant. Cependant, ces résultats préliminaires vont dans le sens de l'utilité d'AMBIANCE comme outil d'évaluation de l'efficacité clinique de la guidance interactive.

ZUSAMMENFASSUNG: Desorganisierte Bindung wurde mit Psychopathologie in Zusammenhang gebracht: Sie wurde durch das Auftreten von atypischer und verstörter Kommunikation während Eltern–Kind Interaktionen mittels des: Atypischen mütterlichen Verhaltensinstruments zur Untersuchung und Klassi-

fikation (AMBIANCE) bestimmt. Diese Studie untersucht die Nützlichkeit des AMBIANCE als Meßinstrument für den Erfolg zweier kurzer Interventionen, um atypisches und verstörtes Verhalten während Spielsituation zu reduzieren. 28 Mutter-Kind Paare (je 14) nahmen teil. Alle Kinder litten an Fütterungsstörungen. Eine Intervention, interaktionelle Beratung, versuchte die Betreuungspersonen zu einem feinfühligem Verhalten im Spiel mit den Kindern zu ermutigen (Spielintervention). Die andere Intervention versuchte den Müttern neue Fütterungstechniken beizubringen (Fütterungsintervention). Die Ergebnisse zeigen einen signifikanten Abfall in den AMBIANCE Werten bei der spielzentrierten Intervention, jedoch keinen Unterschied bei der Fütterungsintervention. Es kam zu einem signifikanten Abfall an verstörter Kommunikation bei der Spielinterventionsgruppe, aber zu keinem Unterschied bei der Fütterungsinterventionsgruppe. 73% der Mütter der Spielinterventionsgruppe und 17% der Mütter der Fütterungsinterventionsgruppe, die anfänglich als „verstört“ klassifiziert wurden, hatten nach der Intervention keine derartige Klassifikation mehr. Die Einschränkungen dieser Studie liegen in der kleinen Stichprobe, Unterschiede im Untersuchungszeitraum und Zuordnung der Stichprobe nach Wunsch. Nichtsdestotrotz stellen sprechen diese vorläufigen Ergebnisse sowohl für die Anwendbarkeit des AMBIANCE als einem Instrument, um klinische Effizienz zu untersuchen, als auch für die Sinnhaftigkeit von Beziehungsberatung.

抄録：親-乳幼児相互作用の間の非定型的行動や中断されたコミュニケーションの表出は、評価と分類のための非定型母性行動測定法 **Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE)** によって評価したところ、混乱 **disorganized** 型の乳児の愛着と関係していた。そしてそれはまた、精神病理と関係していた。今回の研究は、二つの短期介入が遊びの相互作用の間の非定型的な行動と中断されたコミュニケーションを減少させるのに効果があるかの指標としての、**AMBIANCE** の有用性を検討した。28組の母親-乳幼児ペア（それぞれの介入法に14組ずつ）が研究に参加した。全ての乳児には摂食の問題があった。一つの介入法、相互作用ガイダンスは、乳幼児に敏感に反応するように、養育者をトレーニングすることを中心とした（遊びに焦点付けた介入）。もう一つの介入法は、新しい食べさせる技術を使えるように、母親をトレーニングすることを中心とした（摂食に焦点付けた介入法）。結果は、遊びに焦点付けたグループで、介入前と介入後の間で **AMBIANCE** 得点の有意の減少が示されたが、摂食に焦点付けたグループでは見られなかった。遊びに焦点付けたグループでは、介入前のセッションと介入後のセッションのあいだに、中断されたコミュニケーションの水準に有意の減少があったが、摂食に焦点付けたグループでは見られなかった。最初に「中断された」と分類された母親のうち、遊びに焦点付けたグループの **73%**の母親と、摂食に焦点付けたグループの **17%**の母親が、介入後のセッションで「中断されていない」の分類を獲得した。この研究の限界には、標本のサイズが小さいこと、それぞれの介入のための評価のタイミングが異なること、そして都合の良い標本を用いたこと、があげられる。それでもなお、これらの所見は、臨床的効果の評価するための測定法としての **AMBIANCE** の有用性と、相互交流ガイダンスの効果の両者の、予備的な証拠を提供するだろう。

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Strong parent-infant relationships act as a protective factor against the development of a variety of emotional, behavioral, and health problems (Carlson & Sroufe, 1995; Fonagy et al., 1995; Greenberg, 1999; Main, 1996). There is growing prospective and retrospective evidence linking quality of early parent-infant relationships with later serious emotional and

behavioral problems (Dozier, Stovall, & Arbus, 1999; Greenberg, 1999). Specifically, caregivers' inability to "read" children's signals, insensitive responses to their children's cues and signals, and various forms of maltreatment (which can be viewed as extreme insensitivity) are presumed to relate to poor socio-emotional outcomes (Allen, Hauser, & Borman-Spurell, 1996; Cassidy, Kirsh, Scolton, & Parke, 1996; Erickson, Sroufe, & Egeland, 1985; Greenberg, Speltz, DeKlyen, & Jones, 1998; Kobak, Sudler, & Gamble, 1991; Liotti, 1995; Lyons-Ruth, Easterbrooks, Davidson, Cibelli, & Bronfman, 1995; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Patterson, DeBaryshe, & Ramsey, 1989; Rubin, Hymel, Mills, & Rose-Krasnor, 1991). Thus many clinical interventions designed for infants and their families focus on helping parents to read their young child's cues and signals (Cohen et al., 1999; Heinicke et al., 1999; Lieberman, Silverman, & Pawl, 2000; McDonough, 1993, 2000). Empirical studies to evaluate the effectiveness of such interventions have used either maternal sensitivity or child security of attachment or both as primary outcome measures and have yielded conflicting results (Lieberman et al., 2000; van IJzendoorn, 1995).

Recently, Lyons-Ruth and her colleagues (Bronfman, Parsons & Lyons-Ruth, 1999) have developed a scheme to identify atypical behaviors thought to disrupt formation of parent–infant relationships, the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE). The purpose of the present study is to determine whether caregiver behaviors measured by the AMBIANCE will decline as a result of intervention. The effects of two interventions are compared: One is specifically focused on training caregivers to read and respond more sensitively to their infant's cues, the other focuses on training caregivers to extinguish problem feeding behaviors in the infant.

BACKGROUND

Attachment theory (Bowlby, 1982) and findings from attachment research provide a conceptual framework and empirical evidence to support the view that quality of parents' responses to their infants' cues and signals is a critical factor in the development of a strong parent-child relationship (or feelings of security in the child). Bowlby (1982) suggested that attachment is an organized system whose goal is to make individuals feel safe and secure. Whenever safety is threatened, the attachment system is "activated" and attachment behaviors can be observed, that is, infants seek contact with their attachment figure and try to elicit caregiving responses through crying, clinging, etc. Three circumstances particularly "activate" attachment behaviors (the attachment system itself is "continually active" in infancy; Main, 1999): (a) emotional upset (e.g., fear, sadness), (b) physical hurt, and (c) illness. The quality of the parent's response to the infant under these circumstances is critical in determining whether the infant learns to feel safe with the parent and secure in the knowledge that the parent will be there when needed. Different patterns of parent response to infant attachment behavior lead the infant to pattern subsequent attachment behavior in systematic strategies to maintain feelings of security. Three organized infant attachment strategies have been identified (Ainsworth, Blehar, Waters, & Wall, 1978), one considered optimal or secure, and two considered less optimal and insecure (avoidance and resistance). However, the attachment pattern most closely linked with psychopathology (Dozier et al., 1999; Lyons-Ruth & Jacobvitz, 1999) is characterized by lack of an organized strategy for using a caregiver in times of distress, revealed through odd behaviors (e.g., repeated incomplete approaches to the parent, stalling, failing to seek contact when very distressed) that appear to reflect fear and confusion on the part of the infant. Infants who behave in this fashion are considered to be disorganized/disoriented with respect to attachment (Main & Solomon, 1990).

Although disorganized attachment is overrepresented in samples with known maltreatment and care by psychiatrically diagnosed parents, it also occurs at lower rates in community samples in the absence of these risk factors (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). In these circumstances it is frequently associated with the parent's experience of unresolved attachment losses (through death) or traumas (specifically sexual and physical abuse; Main & Hesse, 1990). Similarly, feeding problems and failure to thrive have been associated with disorganized infant attachment and an overrepresentation of unresolved mourning or trauma in the parents (Benoit, Zeanah, & Barton, 1989; Coolbear & Benoit, 1999; Crittenden, 1987; Valenzuela, 1990; Ward, Kessler, & Altman, 1993; Ward, Lee, & Lipper, 2000). Until recently, there was little understanding of links between parental unresolved loss and trauma and specific parent behaviors that might disrupt early relationship formation and lead to disorganized attachment. Whereas individual differences in parent sensitivity/responsiveness have been shown to predict the three organized patterns of infant attachment (e.g., Ainsworth et al., 1978; Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985) but not disorganized attachment, disorganized attachment is now thought to arise when the figure who would normally be a source of security is also a source of fear (Main & Hesse, 1990). Under these conditions, a distressed infant is placed in an approach-avoidance conflict: The infant expects that the approach that could reduce distress is equally likely to increase distress. This conflict is thought to give rise to the odd behaviors indicative of disorganized attachment.

Overt maltreatment is one form of frightening caregiver behavior but subtle and brief behaviors can also be frightening (e.g., suddenly looming toward the infant without giving a signal that a game is intended, exaggerated startles in response to the infant's fall, periods of being dazed and unresponsive). Several different instruments have been developed to assess parents' proclivity to engage in these subtle but still disturbing behaviors. Main and Hesse (1992) described a coding system that focuses on frightening and frightened parent behavior, which they refer to as "Fr-behavior." This system has been adapted and expanded by others. With this coding system, Jacobvitz, Hazan, and Riggs (1997) found associations between a prenatal assessment of maternal unresolved loss in 113 pregnant women and their display of Fr-behaviors toward the infant at 8 months.

Schuengel, Bakermans-Kranenburg, and van IJzendoorn (1999) studied 85 mother-infant pairs in which the mother had experienced the death of someone important. The Adult Attachment Interview (George, Kaplan, & Main, 1985) was used to assess presence of unresolved loss. Observations of mother-infant interaction were made at home when the infants were 10–11 months old. A scale for Fr-behavior was developed based on examples described by Main and Hesse (1992). It included three subscales: frightening behavior, dissociated behavior, and frightened/deferential behavior as well as a summary score for disorganizing behavior. Mothers of disorganized infants had higher disorganizing scores than mothers of organized infants. Furthermore, mothers with unresolved loss reported more dissociative experiences and exhibited more Fr-behaviors if they were also insecure with respect to attachment.

Lyons-Ruth and Block (1996) expanded on these scales by studying mothers with childhood trauma, and eventually identified five categories of atypical behavior: affective communication errors, role/boundary confusion, fearful/disoriented behavior, intrusiveness/negativity, and withdrawal. On the basis of a summary scale for degree of disrupted communication, mothers are classified as disrupted or not disrupted in communications to the infant (Lyons-Ruth, Bronfman, & Parsons, 1999). This system, the AMBIANCE, was used to code videotapes of 65 mothers and their 18-month-olds in a high risk sample during the Strange Situation. Mothers of disorganized infants showed more total atypical behaviors, more affective communication errors and more disorientation than mothers of infants with organized

patterns of attachment (Lyons-Ruth et al., 1999). Thus, parental atypical behavior appears to be one pathway to disorganized attachment in infancy and possibly to the later psychopathology associated with disorganized attachment.

Because the discovery of disruptive (including Fr-) behaviors is relatively recent, existing clinical interventions have focused on sensitivity/responsiveness, which is known to predict individual differences in organized attachment. Research findings and clinical experience suggest that it is possible to change parental responsiveness and sensitivity (e.g., Lieberman, 1994; McDonough, 2000; Heinicke et al., 1999; van IJzendoorn, 1995). Yet, no study has been able to examine systematically whether clinical interventions and caregiver training in sensitive responsiveness might affect parents' atypical disruptive behaviors. With instruments such as the AMBIANCE now available, such endeavors may be feasible. The present study is a pilot effort of this type.

HYPOTHESES

The primary objective of this study is to determine whether the AMBIANCE will detect change in caregivers' disruptive behaviors during play interactions with their feeding-disordered infants as affected by two brief, focused interventions. One intervention focuses on training caregivers to read and respond sensitively to their infants' cues (play-focused intervention). The second focuses on training caregivers to extinguish problem feeding behaviors in the infant (feeding-focused intervention) and does not include any training of sensitivity. It is hypothesized that only the play-focused intervention will be associated with a reduction in the level of disrupted communication from pre- to posttreatment. Furthermore, caregivers in this group will be less likely to receive classifications of "disrupted communication" posttreatment than parents receiving the feeding-focused intervention. In the feeding-focused intervention, the level and classification of disrupted communication for the parents is expected to remain stable from baseline to posttreatment.

METHOD

Participants

The total sample ($N = 28$) consists of mother–infant dyads from two convenience samples with feeding problems. The first group ($N = 14$) includes subjects who were referred to an infant psychiatry clinic in a tertiary care pediatric hospital in a large Canadian metropolitan area, for assessment of feeding difficulties. The feeding problems in all cases in this first group were believed to be attributable, in part, to parent–child relationship difficulties so all dyads were enrolled in brief, focused parent–infant therapy (modified Interaction Guidance; McDonough, 1993, 2000), a play-focused intervention that aims to increase parent sensitivity. These 14 mother–infant pairs were individually matched (on infant gender and age and maternal age, education, and socioeconomic status) with 14 parent–infant pairs from participants in a randomized controlled clinical trial the purpose of which was to assess the efficacy of a behavioral intervention, based in the same hospital outpatient clinic, to treat tube-fed infants with feeding problems (Benoit, Zlotkin, & Wang, 2000). Only parents who were randomized to receive a brief feeding-focused behavioral intervention aimed at extinguishing specific problem feeding behaviors in the child as part of the randomized trial were included in the present study. The primary exclusion criterion in the randomized trial was serious health problems (e.g., neurologically based swallowing difficulty).

Infants in the first group had feeding problems that included food refusal, with or without

associated failure to thrive, and with or without associated regulatory difficulties (none had enterostomy tube feedings at the time of intervention). Infants in the second group had feeding problems that included food refusal associated with “posttraumatic feeding disorders.” All infants in the second group had had a history of serious medical problems that contributed to the need for enterostomy tube feedings, all were dependent on enterostomy tube feedings at the time of intervention, some had failure to thrive (despite tube feeding), and some also had regulatory difficulties (Benoit et al., 2000). All 28 mothers spoke English fluently and gave informed consent for the data collected to be used for research. Table 1 summarizes the demographics for each of the two groups. There were no significant demographic differences between them.

Interventions

Play-focused intervention (modified Interaction Guidance). Interaction Guidance (McDonough, 1993, 2000) is an intervention developed primarily to reach families that have been difficult to engage; that are burdened by social adversity such as poverty, violence, and lack of education; that have a limited capacity for introspection; and that have resisted previous offers of help using more traditional psychotherapeutic methods (McDonough, 1993, 2000). In a preliminary study in Switzerland, Interaction Guidance was found to be as effective as brief psychoanalytical psychotherapy in improving mothers’ interactions with their infants, perceptions of their infants, and symptomatology in a middle-class, clinic-referred sample (Cramer et al., 1990). Interaction Guidance is currently being used in a program for maltreated infants and toddlers in foster care in New Orleans, LA (Larrieu & Zeanah, 1998; Lieberman & Zeanah, 1999).

In the present study, the traditional Interaction Guidance (McDonough, 2000) was modified to include an individually tailored educational component (e.g., information about regulatory difficulties or other specific problems if such difficulties were exhibited by the infant). It consisted of 90-min weekly sessions (with approximately 15 minutes of videotaped interaction followed by 75 minutes of discussion, education, and feedback) administered by the first author for 5 consecutive weeks. The interaction videotaped at the fifth treatment session was used for the posttreatment outcome for this group in the present study. Upon review, it was found that the fifth session for one of the parent–infant pairs in this group was not a free play session

TABLE 1. *Sample Demographics*

	<i>Play-Focused Group</i> (<i>N</i> = 13)	<i>Feeding-Focused Group</i> (<i>N</i> = 14)
	<i>Mean (SD)</i>	<i>Mean (SD)</i>
Mother		
Mother’s age (years)	32.3 (6.7)	30.8 (5.9)
Mother’s education (years)	14.1 (2.7)	13.8 (3.5)
Hollingshead	47.9 (18.5)	37.8 (17.6)
Infant		
Infant’s age (in months)	18.2 (5.9)	17.5 (7.9)
Birthweight of child (grams)	3178.4 (1072.1)	2466.6 (1231.0)
Gender (Male)	61.5%	57.1%
First born	62.9%	62.9%

but one in which the mother had been instructed to restrict her response to the infant for therapeutic purposes. This pair was therefore omitted from further coding and analysis, leaving 13 participating pairs in the play-focused group for data analysis.

Feeding-focused intervention (behavior modification). For 7 consecutive weeks, infants and their primary feeders attended a weekly clinic with one dietitian trained in the use of behavior therapy and supervised by the first author. During each 90-min treatment visit, feeders received training on behavioral techniques to eliminate specific problem behaviors in a predetermined sequence. At each visit, 3–5 problem behaviors were targeted. The primary technique used was extinction (Benoit et al., 2000).

Procedures

Mothers and infants in both groups were seen for a baseline visit during which the play interaction, along with other procedures (e.g., feeding), was videotaped. During that visit, mothers were asked to play with their infants as they normally would at home, for seven minutes in a room with age appropriate toys. For the feeding-focused intervention group, the play interactions of feeders and infants were again videotaped 14 weeks after the completion of the 7-week intervention (as the protocol for the randomized controlled trial required) and the same instructions as at baseline were provided to the feeders. These play interactions videotaped 14 weeks after the completion of the 7-week intervention were used in the present study for the post treatment outcome.

Measures

The AMBIANCE (Bronfman et al., 1999) was used to code atypical maternal behavior during a 5-min play interaction. The AMBIANCE provides scores for the following: (a) totals for five separate dimensions: affective communication errors, role/boundary confusion (role reversal), frightened/disoriented behavior, intrusiveness/negativity and withdrawal; (b) a summary score obtained by adding scores for each of the five dimensions; (c) a qualitative 7-point scale for level of disrupted communication; and (d) a bivariate classification for disrupted or not disrupted communication. Because a withdrawn mother may get a high global score or be classified disrupted as a result of interacting very little with her infant, total scores are independent of classification and global level of disruption scores. A very low total score can indicate either very little disrupted communication or very disrupted (withdrawn) communication. For the purpose of the present study, where our hypotheses focus on global changes in parent behavior, we chose to focus primarily on the global measures. Thus, only total score, level of disruption, and the bivariate classification were used as dependent measures. This is a relatively new instrument and no particular cutoffs have been established for either global score categories or classifications. Therefore coders were instructed to assign global scores and classifications independently, and independent of total scores.

The first 5 minutes of the baseline and posttreatment play sessions for each mother–infant pair were coded by three coders who were trained by K. Lyons-Ruth and E. Bronfman and were reliable in the use of the AMBIANCE. All three coders were blind to the intervention and “timing” of the play session they were assigned to code. Each coder rated 23 randomly selected play interactions. Coding assignments were organized so that nine tapes were coded by all three coders for reliability purposes. For total number of disruptive behaviors, Pearson r between pairs of coders ranged from .74 to .91 with a mean of .79. Correlations for level of disruption ranged from .60 to .72 with a mean of .65. For the bivariate classification of disrupted versus not disrupted two of the coders agreed on 100% of the cases and the third agreed on

all but one case to yield an overall kappa of .77. Where there were disagreements between coders, consensus scores were entered into the analyses. Although some of these reliability coefficients are marginally acceptable (e.g., level of disruption), we retained these measures. Since this is a first trial of this system outside of the laboratory of origin, it is of interest to assess potential usefulness as well as ease of use of these measures.

RESULTS

The primary hypothesis of the study was that the AMBIANCE scores in the play-focused intervention group, but not the feeding-focused intervention group would show a decrease in atypical behaviors, level of disrupted communication, and classification as disrupted from pre- to postintervention play sessions. The first two predictions were tested using a 2 (Group) \times 2 (Session) two-way ANCOVA with session as a repeated measure and Hollingshead index as the covariate, and the final prediction was tested using a chi-square test. Means, standard deviations, and frequencies are shown in Table 2. Effect sizes for the parametric analyses are indicated by ω^2 , which indicates the proportion of the variance accounted for. Values for ω^2 parallel those for d but cutoff values are different: .01–.06 indicates a small effect size, .06–.14 a medium effect size and .14 and above, a large effect size. Effect sizes for nonparametric analyses are based on Cramer's v based on calculation of ϕ^1 .

Atypical Behavior

A 2 (Intervention Group) \times 2 (Session) repeated-measures ANOVA was conducted on the total number of atypical maternal behaviors, with intervention group as the between-subject variable, and session (pretreatment versus posttreatment) as the repeated measure. There were no significant main effects. As predicted, there was a significant interaction between intervention group and session, $F_{(1, 25)} = 7.134, p < .02$. Follow-up t tests confirm that the main effect is primarily attributable to a significant decrease in atypical behaviors in the play-focused group from pre- to postintervention ($t(12) = 2.9, p < .01; \omega^2 = .12$); whereas atypical behaviors in the feeding-focused group remained stable from pre- to postintervention sessions ($t(13) = -.36, p < .75$).

Level of Disrupted Communication

A parallel 2 (Intervention Group) \times 2 (Session) repeated measures ANOVA was conducted on level of disrupted communication and yielded no significant main effects. As predicted,

TABLE 2. Mean AMBIANCE Scores Pre- and Postintervention

Intervention	Total Score		Level of Disruption		Classified Disrupted (N)	
	Pre	Post	Pre	Post	Pre	Post
Play focused	33.7 (26.3) ^a	11.7 (11.1)	4.9 (1.7)	2.9 (1.7)	11	3
Feeding focused	25.1 (12.6)	26.4 (12.1)	4.0 (2.0)	4.6 (1.3)	6	7

^a Figures in parentheses are standard deviations.

there was a significant interaction between intervention group and session, $F_{(1, 25)} = 11.13, p < .003$. Follow-up t tests showed that there was a significant decrease in level of disrupted communication from pre- to postintervention sessions in the play-focused group ($t(12) = 3.9, p < .002; \omega^2 = .16$); but the feeding-focused group remained stable from pre- to postintervention sessions ($t(13) = -1.3, p < .21$). Although we noted earlier the marginal reliability on this measure, the data yielded are consistent with the other findings reported here.

Classification as Disrupted

At the preintervention session, 11/13 (85%) of mothers in the play-focused group and only 6/14 (43%) of mothers in the feeding-focused group were classified as “disrupted,” leaving two (15%) mothers in the play-focused group and eight (57%) mothers in the feeding-focused group classified as “nondisrupted.” The high rate of initial disruption in the play-focused group is consistent with the clinical judgment that these pairs were presenting with relationship difficulties and could benefit from an intervention that focused on improving interactions.

Eight of the 11 (73%) mothers from the play-focused group and only one of the six (17%) mothers from the feeding-focused group initially classified as “disrupted” attained a classification of “nondisrupted” at the postintervention session. Two mothers in the play-focused group and two mothers in the feeding-focused groups had stable classifications of “nondisrupted” from pre- to postintervention. Finally, two mothers in the feeding-focused group (and none in the play-focused group) initially classified as “non-disrupted” in the preintervention session attained a classification of “disrupted” at the postintervention session. Although initially more of the mothers in the play focused group were classified “disrupted” (11 versus 6), at the postintervention session, the play-focused group was more likely to attain a classification of “nondisrupted” than the feeding-focused group. A 2 (Intervention Group) \times 2 (Disrupted or Not Disrupted) chi-square test ($\chi^2(1, N = 27) = 4.90, p < .05; \phi^1 = .43$) confirmed that these apparent differences are significant.

DISCUSSION

The present data confirm our original prediction that AMBIANCE scores would reflect effects of caregiver training designed to enhance caregiver sensitivity to infants’ cues and signals. Thus the modified Interaction Guidance used in the play-focused group has the effect of reducing the frequency of atypical disruptive behaviors that the caregiver exhibits in the course of play interactions with an infant. This finding is encouraging preliminary evidence both of the effectiveness of the Interaction Guidance intervention and the usefulness of the AMBIANCE as an instrument for assessing clinical efficacy. However, generalization of these results beyond immediate place and time of the initial intervention must await future work. Further, these encouraging findings must first be considered in the context of alternative explanations for the findings.

First, the present study was based on convenience samples that, although similar in presenting with feeding problems, differed in the reason for assignment to intervention conditions. In the play-focused group, the feeding difficulties were judged to reflect underlying relationship problems and the play-focused intervention was selected as an appropriate treatment. In contrast, in the feeding-focused group, choice of treatment was based on random assignment for experimental purposes. Consistent with this difference, there were more cases of disrupted communication at baseline in the play-focused group than in the feeding-focused group. Nevertheless, whereas the majority of the mothers judged to use disrupted communication at baseline in the play-focused group were no longer using disrupted communication at the posttreat-

ment session, only one of six initially disrupted mothers in the feeding focused group was considered to be nondisrupted in the posttreatment session.

Second, for the play-focused group, both training and assessment occurred in the context of play and this may have enhanced the likelihood of observing change. It is not clear whether these changes persist beyond the period of treatment or generalize to other situations. The absence of change in the feeding-focused group is open to several explanations. We expected to see little change in this group because the intervention itself did not aim to enhance caregiver sensitivity either in play or feeding situations. It is also the case that the posttreatment session for this group occurred 14 weeks after completion of the treatment. These caregivers may have made changes in behavior that were not maintained long enough to be captured in the post-treatment session. It is also possible that the impressive changes noted at 5 weeks in the play-focused intervention would not be maintained 14 weeks after completion of the treatment. Future research should address these issues.

Although the present data must be considered suggestive rather than conclusive, for the reasons discussed above, the results indicate that interventions aimed at increasing parent sensitivity may also have the effect of reducing the disruptive behaviors considered to contribute to disorganized infant attachment. This raises the question as to whether the behaviors assessed on the AMBIANCE are simply extreme examples of insensitivity or whether, as Main and Hesse's (1990, 1992) discussion of Fr-behaviors suggests, they are qualitatively different from other insensitive behaviors. Future research should also examine the question of whether a coding system that focuses on identifying a range of atypical caregiver behaviors is a better tool to assess problematic caregiver–infant relationships (and perhaps guide intervention efforts) than one that focuses on describing positive aspects of the relationship, such as sensitivity. Given the high prevalence of disorganized attachment in clinical settings, and given that caregiver sensitivity does not appear to predict infant disorganization (while atypical caregiver behavior appears to predict disorganization), one could argue that a coding system that assesses only aspects of caregiver sensitivity might not be as helpful clinically as a coding system that assesses atypical caregiver behaviors associated with disorganized attachment. It could also be that both atypical caregiver behaviors and caregiver sensitivity need to be assessed in clinical settings. Future research should examine these questions.

The success of this brief intervention specifically focused on increasing parent sensitivity may be contrasted with traditional interventions for infants and their families. Most parent–infant psychotherapy prevention and intervention programs have been based on psychoanalytical principles and require a fair degree of commitment, willingness and capacity to explore past experiences, and psychological and cognitive sophistication on the part of the parent (Cohen et al., 1999; Cramer et al., 1990; Fraiberg, Adelson, & Shapiro, 1975; Lieberman & Pawl, 1993; Stern, 1995). However, many caregivers from high-risk backgrounds who are burdened by poverty, violence, lack of education, lack of trust in authority figures, and a limited capacity for introspection, may not be able to benefit from such interventions as much as caregivers without such characteristics. It is now recognized that “retrieving the past is not invariably the key to healing in the present” (Lieberman & Zeanah, 1999, p. 556) and that significant changes in the quality of the relationship between a parent and child can occur even without rehashing the past (Cramer et al., 1990; McDonough, 1993, 2000). Findings from the present study provide some evidence for this view and suggest that the use of brief, focused interventions dealing in the here and now, such as Interaction Guidance, can be helpful in clinical groups at risk for developing further serious emotional and behavioral problems.

The advantages of brief interventions are further underscored by a meta-analysis on the effects of attachment-based interventions on maternal sensitivity and infant security. In this statistical review which included 16 studies on 869 parent–infant dyads, van IJzendoorn (1995)

demonstrated that the interventions in these studies were more effective in changing parental insensitivity ($d = .58$) than in changing children's insecure organized attachment ($d = .17$). Furthermore, they demonstrated that longer and more intensive interventions were less effective ($d = .00$, based on 7 studies) than short-term interventions ($d = .48$, based on 5 studies). Although, this meta-analysis has been criticized for including studies with widely varying sample characteristics, inconsistencies in the interventions, variability in the degree to which the interventions were designed to address different outcomes, and incomplete assessment of the essential components of the parent-child relationship (Lieberman & Zeanah, 1999), it also suggests that brief, focused interventions can be helpful. The present data indicate that one brief, focused intervention, Interaction Guidance, is effective in reducing the occurrence of disrupted mother-infant communication. It remains to be seen whether other brief, focused interventions have similar effects.

The present data further indicate that the AMBIANCE is highly sensitive to differences in caregiver behavior associated with clinical problems and their treatment. It picked up differences between dyads referred for treatment of feeding problems that were considered to have underlying relationship problems (play-focused group) and those with feeding problems assigned randomly to treatments for experimental purposes. At baseline, less than half of the mothers in the latter group were classified as disrupted compared to the majority of mothers in the former. It also identified appropriate changes in maternal behavior from pre- to post-treatment assessment. In the group where intervention focused on interactive behavior (play-focused group), total number of disruptive behaviors, rating of disruption, and the number of disrupted mothers all decreased from pre- to postintervention. Although not assessed in the present study, these shifts may also be indicative of other positive changes in maternal behavior. In the group whose training focused on changing specific caregiver behavior (feeding technique) to create change in infant problematic feeding behavior (feeding-focused group), there was little evidence of change in the mothers' use of atypical behavior (as assessed by AMBIANCE) from pre- to posttreatment play sessions.

The AMBIANCE was originally designed as a research tool for the purpose of tracing the origins of infant disorganized attachment and its links to emotional and behavioral problems. Its prior use has thus far been limited to research in high-risk populations, although our team is presently using it in studies that include normative community samples. The present pilot study demonstrates its applicability to clinical studies particularly those designed to assess treatment efficacy and effectiveness. Given that caregiver atypical behavior (as assessed by AMBIANCE) has been linked to disorganized infant attachment (Lyons-Ruth et al., 1999), which in turn may be one of the strongest childhood risks for socioemotional maladjustment and psychopathology (Boris, Fueyo, & Zeanah, 1997; Carlson, 1998; Lyons-Ruth, 1996; Lyons-Ruth & Block, 1996; Main & Cassidy, 1988; Zeanah et al., 1997), AMBIANCE could become a useful tool in clinical settings. We also note, however, that our reliability for some scales was marginally acceptable. This suggests that more intensive training or further articulation in the manual may be required in preparing this tool for broad use.

The present study suggests numerous questions for further investigation. This preliminary demonstration indicates that the field is ripe for more stringent study designs, such as randomized controlled trials, to examine the efficacy and effectiveness of Interaction Guidance (as well as other brief interventions) in reducing or eliminating caregiver atypical behavior and disrupted communication, and that AMBIANCE is a useful outcome measure for such endeavors.

Since the AMBIANCE is a relatively new measure and the present study represents one of its first uses outside the laboratory of the developers, further development of the instrument

and training procedures is warranted. Given that the AMBIANCE includes a number of subscales, it is of interest to know whether global changes such as those observed in the present study are accounted for by changes in all types of atypical behaviors or whether some are more responsive to intervention than others. Further work might also be directed to the question of whether some AMBIANCE behaviors are simply extreme versions of insensitivity whereas others are qualitatively different and whether these two kinds of behaviors are differentially relevant to outcomes in both research and clinical samples. More extensive data from different samples and scoring by different coders can contribute to greater standardization of the instrument with potential for developing formal norms and cutoff scores.

With respect to the efficacy of Interaction Guidance, a longer follow-up period than that used in the present study can document whether observed improvements attributed to Interaction Guidance are maintained over long periods. Finally, future researchers can examine the question of whether Interaction Guidance not only improves caregiver atypical behavior and disrupted communication, but also reduces the incidence of or alters disorganized infant attachment.

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