PATTERNS OF EMOTIONAL AVAILABILITY IN MOTHER–INFANT DYADS: ASSOCIATIONS WITH MULTIPLE LEVELS OF CONTEXT

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ABSTRACT: This study explored emotional availability (EA)—an individual’s emotional responsiveness and attunement to another’s needs and goals (R.N. Emde, 1980)—among a high social risk group of 226 adolescent mothers and their infants (average = 12 months old). The aim was to identify dyadic patterns of EA and to examine their association with multiple indicators of the ecological context. Maternal sensitivity, maternal nonhostility, and child responsiveness were assessed with the Emotional Availability Scales, Third Edition (Z. Biringen, J. Robinson, & R.N. Emde, 1998) during free play and teaching observations at home. Four EA patterns were identified using k-means cluster analysis: (a) “low functioning,” (b) “high functioning,” (c) “low functioning dyads with nonhostile mothers,” and (d) “inconsistently sensitive mother and responsive child.” These patterns had distinct associations with (a) mothers’ parenting attitudes regarding children’s power and independence and parent–child role reversal, (b) mothers’ strategies in conflict resolution with their partners and their children, and (c) the dyads’ living arrangements. This study makes a contribution to the understanding of the mother–child relationship from a systemic and relational perspective and explores the association of EA patterns with the dyads’ relational context. Implications for programs and treatment approaches aimed at supporting dyads at social risk are discussed.

Keywords: emotional availability, mother–infant interaction, adolescent mother

RESUMEN: Este estudio exploró la afectividad emocional (EA) –capacidad emocional de respuesta y atención de un individuo hacia las necesidades y metas de otro (Emde, 1980)– dentro de un grupo de alto riesgo social de 226 madres adolescentes y sus infantes (promedio 12 meses de edad). El objetivo fue identificar patrones diádicos de EA y examinar sus asociaciones con indicadores múltiples del contexto ecológico. La sensibilidad materna, la no-hostilidad materna, y la capacidad de respuesta del niño se evaluaron por medio de las Escalas de Disponibilidad Emocional (3ª edición; Biringen, Robinson, & Emde, 1998) durante observaciones en casa de juego libre y enseñanzas. Cuatro patrones de EA se identificaron usando análisis de agrupación “K-means:” 1) “bajo funcionamiento;” 2) “alto funcionamiento PubMed;” 3) diáadases bajo funcionamiento PubMed con madres no hostiles; 4) “inconsistentemente madre sensible y niño con capacidad de respuesta.” Estos patrones presentaron asociaciones distintivas con: a) actitudes de crianza de las madres con relación al poder e independencia de los niños y la reversión de papeles entre progenitor y niño, b) estrategias de las madres en resolución de conflictos con sus parejas y sus niños, y c) arreglos de vivienda de la diada. Este estudio contribuye a la comprensión de la relación madre-niño desde una perspectiva sistémica y relacional y explora las asociaciones de patrones de EA con el contexto relacional de las diadas. Se discuten las implicaciones para programas y acercamientos de tratamiento enfocados hacia el apoyo de las diadas bajo riesgo social.

Palabras claves: disponibilidad emocional, interacción entre madre e infante, madre adolescente


Funding for this research was provided by the Massachusetts Children’s Trust, Grant MA 5014.

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View this article online at wileyonlinelibrary.com.
DOI: 10.1002/imhj.21529

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Mots clés: disponibilité emotionnelle, interaction mère-bébé, mère adolescente

Keywords: emotionale Verfügbarkeit, Mutter-Kind-Interaktion, adolescente Mutter

摘 要: 本研究在一個有226個青少年母親及她的嬰兒(平均12月大的)高社會風險組別中探討情緒可親性(EA)–一人對他人的需要和目標之情緒反應度及協調度(Emde, 1980)。目的是識別EAs的二人組合模式，及調查其與多個生態情境指標的關係。在家中自由玩耍及教導觀察時，我們用情緒可親性量表(第三版; Biringen, Robinson, & Emde, 1998)去評量母親的敏感度、母親的非敵意及孩子的反應度。K-均值群分 析識別了四個EA模式: 1)「低功能」; 2)「高功能」; 3)「低功能有非敵意母親的二人組合」; 4)「無常的敏感母親和有反應的孩子」。這些模式與下列因素有顯著關係: a)母親對孩子的權力, 自主及親子角色反態的態度, b)母親解決與伴侶或與孩子衝突的策略, c)母親二人組合的居住安排。本研究用系統性和關係性的角度對識別母親關係作出貢獻,並探討EAs模式與二人組合的關係脈絡之間的關係。對於旨在支持具社會風 險的二人組合之方案及治療取向, 本文研究結果亦有所啟示。

關鍵詞：情緒可親性，母嬰互動，青少年母親

鍵字：Emotionale Verfügbarkeit, Mutter-Kind-Interaktion, adoleszente Mutter

Infant Mental Health Journal DOI 10.1002/imhj. Published on behalf of the Michigan Association for Infant Mental Health.
Mother–infant dyad interaction has been compared with a dance between two partners (Stern, 2009). Each movement, gesture, and emotion of one member has an impact on the other, mutually influencing each other. The dance metaphor for mother–infant interaction is understood by dynamic systems theory as a coregulated process, by which “continuous unfolding of individual action is susceptible to being continuously modified by the continuously changing actions of the partner” (Fogel, 1993, p. 29). This interaction is shaped by the characteristics of both members of the dyad and their situational context, as explicated by relational developmental systems theories (Lerner, Lewin-Bizan, & Warren, 2011).

The dynamic interaction between mother and infant is necessary not only for the infant’s survival but also for the development of his or her internal world, made of the repetition of such interactive experiences transpiring within a relationship (Stern, 2009). As Siegel (2012) noted, “the mind as an emergent property of the body and relationships is created within internal neurophysiological processes and relational experiences” (p. 3). The dyadic relationship forms the context in which the infant can experience a wide range of affective themes such as comfort, dependency, joy, assertiveness, curiosity, and anger (Greenspan & Wieder, 2007). The shared experience of this range of emotions between mother and child organizes both “selves” and the relationship (Phillips & Shonkoff, 2000).

The “room” that emotions have in the relationship and the openness or availability to the other member of the dyad’s emotions, intentions, and desires will shape the interaction as well. Emotional availability (EA) refers to an individual’s emotional responsiveness and attunement to another’s needs and goals (Emde, 1980). It comprises the expression of a range of emotions—negative and positive—and their regulation (Biringen & Easterbrooks, 2012). Empirical research demonstrates that EA in infants and toddlers is associated with child–parent attachment (Aviezer, Sagi, Joels, & Ziv, 1999; Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001; Easterbrooks, Bureau, & Lyons-Ruth, 2012; Sagi, Koren-Karie, Gini, Ziv, & Joels, 2002), children’s emotion expression and regulation (Little & Carter, 2005; Martins, Soares, Martins, Tereno, & Osório, 2012), children’s language development (Lovas, 2002), and social competence (Howes & Obregon, 2009.)

Despite the fact that EA is conceptualized as a relational construct reflecting dyadic coordinated interactions, it typically has been analyzed as separate components, or characteristics, of each individual. One exception is a study by Easterbrooks, Chaudhuri, and Gestsdottir (2005), in which patterns of mother–infant EA were identified. The present study extends this work by investigating associations between patterns of EA and characteristics of the dyads’ personal and social contexts. Although some evidence has linked EA with children’s developmental outcomes, there has been less research exploring which elements of the parents’ personal characteristics and of their context might be shaping the nature of this mutual interaction.

**PERSONAL CHARACTERISTICS OF THE DYADS’ MEMBERS: CONTRIBUTION TO THE INTERACTION**

The personal characteristics that each of the dyad’s members bring to the interaction will shape the nature of the interaction itself. Research has shown associations between children’s temperament (infant’s reactivity), maternal personality (affect, coping styles), and behaviors (warmth, support, sensitivity) (Gudmundson & Leerkes, 2012; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990) supporting the goodness-of-fit model (Thomas & Chess, 1977) of mutual influence. In this regard, one particular characteristic that mothers bring to the interaction is their internal working model of the self, others, and relationships ( Bowlby, 1969). Internal working models are the mental representations of the self and others that are formed in the context of early relationships and that influence behavior, feelings, and beliefs in later relationships throughout the life span (Bowlby, 1969). These representations contain both cognitive/perceptual components and affective components of the experiences (Bretherton, 1985). Hence, mothers’ own parenting experiences during their childhoods and the representations that they made of these experiences will influence how they will parent and interact with their own children (Cassidy & Shaver, 2008). For instance, Stack et al. (2012) found that mothers’ history of aggression and withdrawal during their childhoods was associated with observed hostility during the interaction with their children (Stack et al., 2012). On the other hand, mothers’ experience of nurturing relationships during their childhood has been associated with mothers’ positive EA during young mother–infant interaction (Easterbrooks et al., 2005).

Other characteristics that mothers bring to the mother–infant interaction are their parenting attitudes. Attitudes have been described as an individual’s internal state toward an object or entity that predisposes an individual’s reaction to the object (Holden & Buck, 2002). Research on the coherence between parenting attitudes and parenting behaviors has shown inconsistent associations, perhaps due to the complexity of the association itself. Critiques of this literature have suggested that lack of consistency may be due to deficits in the assessment of attitudes and behaviors, lack of the examination of other parental social cognitions (e.g., beliefs, expectations) contributing to parental behavior, and lack of exploration of attitudes and behaviors in specific contexts (Holden & Buck, 2002). There has been some evidence of attitude–behavior correspondence when specific parental attitudes and behaviors (e.g., beliefs about, and use of, corporal punishment) are examined (Corral-Verdugo, Frias-Armenta, Romero, & Muñoz, 1995; Holden, Coleman, & Schmidt, 1995; Vittrup, Holden, & Buck, 2006).

**DYADIC INTERACTION IS SHAPED BY CONTEXT**

The EA of each member of the dyad is shaped by the dyadic context. Context refers not only to the environment where the dyad lives and participates, which includes their material resources [e.g.,
socioeconomic status (SES) and their communities’ traditions and practices, but also refers to the context of their relationships with others. Relational developmental system theories, for example, Bronfenbrenner’s (1994) bioecological theory and Lerner and Kauffman’s (1985) developmental contextualism, underscore the bidirectional and dynamic relations existing among the multiple levels of organization involved in human life that provide “a framework for the structure of human behavior” (Lerner et al., 2011, p. 14). Bronfenbrenner (1994) defined the context as a set of five nested systems constituting the ecology of human development, including, for example, the microsystem, “a pattern of activities, social roles and interpersonal relations experienced by the developing person” (p. 39); the mesosystem, processes between the individual’s settings (e.g., relations between home and school); and the macrosystem, the overarching pattern of the previous systems, in terms of the belief systems, material resources, and others embedded in each of these systems.

The mother–infant dyad is one of the basic units of the microsystem. At a microsystem level, features of the dyad’s immediate environment (e.g., living arrangement) and the relationships that the dyad or its members establish (e.g., social support network, professional support, couple relationship) can contribute to each member’s participation in the interaction. In this regard, mothers could receive and/or perceive social and professional support from diverse sources (e.g., family members, friends, social programs) and of different types (emotional, instrumental, informational) (Barrera, 1986; Belsky, 1984; Gottlieb & Bergen, 2010; Logsdon, McBride, & Birkimer, 1994) that might directly or indirectly influence parenting behaviors (Belsky, 1984).

One specific kind of social support for mother–infant dyads is support in caregiving for their children. Caregiving provided by others may shape mother–infant interaction. For example, in a study of young mothers and their infants (Easterbrooks et al., 2005), dyads characterized by children’s disengagement from mother–infant interaction despite maternal sensitive behavior had high involvement of grandmothers; in some cases, grandmothers were the main caregivers. The authors noted that “when grandmothers fill primary caregiving roles, the pattern of relationship among mother, grandmother and infant may change” (Easterbrooks et al., 2005, p. 320). Other research with adolescent mothers has suggested that maternal parenting may be more optimal when grandmothers are supportive, but do not co-reside (Coley & Chase-Lansdale, 1998).

Mothers’ relationships with the fathers of their babies, or their romantic partners, also may provide support for parenting. At the same time, they may be sources of conflict and, sometimes, relational violence. In this regard, there has been evidence that children exposed to intimate partner violence demonstrate negative emotional and behavioral outcomes (Kitzmann, Gaylord, Holt, & Kenny, 2003; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). Hostility and conflict in the mother–father relationship may “spill over” into parent–child relationships (Erel & Burman, 1995), via the transfer of mood, affect, and behaviors from one setting to another (mother–child relationship). Easterbrooks and Emde (1988) found that conflictual marital relationships caused mothers to be irritable and emotionally drained, and consequently less attentive and sensitive to their children. In another study, psychological and physical abuse by a partner predicted less maternal warmth (Levendosky & Graham-Bermann, 2000). These relations between conflict in the mother–father/partner relationship and mothers’ parenting behaviors have not been explored among adolescent mothers, and the spillover effect on dyadic EA remains to be documented.

In sum, the exploration of the dyadic mother–infant interaction is enriched by both considering the particular context in which the dyad is situated, in terms of their microsystems, and by taking into account each member’s contribution to the dyadic interaction and their personal characteristics and behaviors. In this respect, the Emotional Availability Scales (EAS; Biringen, Robinson, & Emde, 1998) are considered a relationship evaluation system, as they recognize both members of the dyads’ contribution to the interaction as well as how each partner is affected and changed by the partner’s influence (Biringen, Derscheid, Vliegen, Closson, & Easterbrooks, 2014). Even when conceptualized as a relational construct, EA has been analyzed primarily as an individual characteristic by separately exploring either a caregiver’s EA or a child’s EA. The present study takes a dyadic approach to explore patterns of dyadic EA (Biringen et al., 2014).

**THE PRESENT STUDY**

The aim of this study was (a) to explore the mother–infant interaction from a dyadic perspective, with a focus on the EA between members of the dyad; and (b) to explore how this interaction is shaped by the mothers’ personal characteristics and the dyads’ context of relationships with others, at a microsystem level. The study sample was comprised of young mother–infant dyads who might be considered at risk for difficulties in EA and who might exhibit a range of parenting attitudes and contextual risks and assets.

**METHODS**

**Sample and Procedure**

The sample was comprised of 226 mother–infant dyads participating in the evaluation of the Massachusetts Healthy Families program, a statewide home-visiting program for young, first-time mothers (<21 years old) and their infants. Mothers were participants in a randomized controlled trial of the program ($n = 129$ randomly assigned to home-visiting services; $n = 97$ mothers assigned to the control group that received referrals to other services and information). Dyads were seen in their homes at the time of study enrollment (T1) and 12 months later (T2). At the T2 home visit, mothers were on average 19.8 years old ($SD = 1.34$, range $= 17.2–22.8$); children were 12.1 months old ($SD = 5.27$, range $= 5.4–27.6$ months). Distribution of maternal race was 39% White, 19% Black or African American, 2.8% Asian, 6.5% Multiracial,
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and 32% other race. Mothers’ ethnicity was 37.6% Hispanic or Latina. Educational status at T2 was as follows: 59.8% high-school graduates, 16.9% dropped out, and 21.3% were currently enrolled in school.

Data on demographic (e.g., living arrangements, educational status) and contextual (e.g., parenting attitudes, mother–father relationship) characteristics were collected via semistructured interviews and standardized questionnaires. Mother–infant dyads were videotaped during free play and teaching observations at T2. Data about the number of home visits received was collected from the home-visiting program’s management information system.

Tufts University Institutional Review Board approved the study.

Measures

EA (T2). EA in the mother–child dyad was assessed from videotaped observations of mother–child during free play (5 min) and teaching task (5 min) interactions at home, and was coded using the Emotional EAS, Third edition (Biringen et al., 1998). Dimensions assessed were parental sensitivity, parental nonhostility, and child responsiveness. Parental sensitivity refers to the parent’s ability to be warm and emotionally connected with the child. The components of the construct include affect, clarity of perceptions, awareness of timing, flexibility, acceptance of the child, amount of interaction, and conflict negotiation. Scores range from 1 (highly insensitive) to 9 (highly sensitive). A score of 1 is described as a parent showing extreme insensitivity to the child’s communications and little apparent knowledge of crucial childrearing techniques; a score of 9 indicates a parent’s accurate reading of the child’s signals and display of authentic and congruent positive emotions. Scores of 4 and below are considered nonoptimal. Nonhostility assesses the degree of parental hostility, which could be either overt or covert. Hostility is present as negativity, ridiculing, or frightening behaviors. Scores range from 1 (markedly and overtly hostile) to 5 (nonhostile). A score of 1 is described as overtly harsh, abrasive, and demeaning behaviors; a score of 5 indicates no expression of overt or covert hostility behaviors toward the child. Scores of 3 and below are considered nonoptimal. Child responsiveness refers to the child’s response—its existence and its affective quality—to the mother’s bids for interaction. Scores range from 1 (clearly nonoptimal in responsiveness) to 7 (optimal in responsiveness). A score of 1 is described as rarely emotional and behavioral responsiveness (of the optimal kind) when engaged with the mother and rarely responds to parental initiative. A score of 7 describes an optimal balance between responsiveness and autonomous activities, and the child responds to maternal bids for interaction with an enthusiastic and engaged tone. In this case, the child does not show signs of overly connecting with the mother, through negative affect, or avoiding her; hence, keeping a balance between connection and autonomy. Scores of 4 and below are considered nonoptimal. Higher scores reflect optimal mother–infant emotional connections. Videos were coded by trained raters who achieved interrater reliability ranging from 0.88 to 0.91, using average absolute agreement intraclass correlation coefficients (ICC) in a two-way random effect model (McGraw & Wong, 1996).

Mothers’ parenting attitudes (T1). Parenting attitudes were assessed with the Adult Adolescent Parenting Inventory-2 (AAPI-2; Bavolek & Keene, 2001), a 40-item self-report questionnaire. Using 5-point Likert scales, the AAPI2 assesses five domains of parenting attitudes: (a) inappropriate parental expectations about the child (e.g., “Good children always obey their parents.”), (b) parental lack of empathic awareness (e.g., “There is nothing worse than a strong-willed two-year-old.”), (c) strong belief in the use and value of corporal punishment (e.g., “A good spanking never hurt anyone.”), (d) parent–child role reversal (e.g., “Children should be responsible for the well-being of their parents.” “Children should be their parents’ best friend.”), and (e) oppressing children’s power and independence (e.g., “Children who receive praise will think too much of themselves.”). Raw scores are converted to standard scores ranging from 1 to 10; scores of 1 to 3 suggest “high-risk” for abusive parenting attitudes and childrearing, scores of 4 to 7 suggest “medium risk,” and scores of 8 to 10 indicates “low risk.” Cronbach’s αs in the development sample ranged from 0.8 to 0.92 (Bavolek & Keene, 2001).

Mothers’ tactics in the resolution of conflict with their children (T2). Tactics used in mother–child conflict resolution were assessed with the 35-item self-report questionnaire Conflict Tactics Scales–Parent-Child (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). The dimensions measured were (a) nonviolent discipline (e.g., “You took away privileges or grounded your child.”), (b) psychological aggression (e.g., “You threatened to spank or hit your child but did not actually do it.”), (c) neglect (e.g., “You were so drunk or high that you had a problem taking care of your child.”), (d) corporal punishment (e.g., “You slapped your child on the hand, arm, or leg.”), (e) sexual abuse (e.g., “Has your child been touched in a sexual way by an adult or older child when your child did not want to be touched that way, or has he or she been forced to touch an adult or an older child in a sexual way—including anyone who was a member of your family or anyone outside your family?”), (f) physical abuse (e.g., “You hit your child on some other part of the body besides the bottom with something like a belt, hairbrush, or some other hard object.”), and (g) physical violence (combines corporal-punishment and physical-abuse items). This study utilized the lifetime prevalence of such acts, indicating the occurrence of each statement using “never happened” and “happened at least once in lifetime.” The CTS-PC has adequate test-retest reliability and construct validity. However, it shows low internal consistency, with α coefficients ranging from 0.22 to 0.70; parents who maltreat their children in one way do not necessarily maltreat their children in other ways. Straus et al. (1998) argued that these items may be most useful for a binary determination of whether the parent has engaged in one or more acts of maltreatment.
Mothers’ experience of maltreatment during their own childhood (T2). Mothers’ experience of abuse or neglect during their own childhood was assessed with the Conflict Tactics Scales–Adult Recall (CTSPC-CA; Straus, 1999), a 27-item self-report questionnaire. The dimensions assessed were (a) nonviolent discipline (e.g., “My caregiver put me in “time out” or sent me to my room.”), (b) psychological aggression (e.g., “My caregiver shouted, yelled, or screamed at me.”), (c) physical assault (e.g., “Slapped me on the face or head or ears”), (d) neglect (e.g., “She/He wasn’t able to give me the food I needed.”), and an (e) abuse and neglect composite. Mothers indicated the lifetime prevalence (“your whole life”) of each statement using “did not experience” and “experienced at least one type of act.” Cronbach’s α for CTSPC-CA ever prevalent range from 0.62 to 0.88 (Chan, 2005).

Tactics regarding conflict resolution with their partner (T2). Mothers’ tactics used in the resolution of conflict with their partners was assessed with the Conflict Tactics Scales–Partner short form (CTS2S; Straus & Douglas, 2004), a 20-item self-report questionnaire that assesses the use of psychological and physical aggression in the resolution of conflict by each member of the couple. This study examines the partners’ practices as reported by the mothers. The dimensions measured were (a) negotiation (e.g., “My partner explained his or her side or suggested a compromise for a disagreement with me.”), (b) physical assault (e.g., “My partner pushed, shoved, or slapped me.”), (c) psychological aggression (e.g., “My partner destroyed something belonging to me or threatened to hit me.”), (d) injury (e.g., “I had a sprain, bruise, or small cut, or felt pain the next day because of a fight with my partner.”), and (e) sexual coercion [e.g., “My partner used force (like hitting, holding down, or using a weapon) to make me have sex.”]. Mothers indicated the lifetime prevalence of each statement using “occurred” and “has not occurred” during their life. Internal consistency ranges from 0.79 to 0.95; concurrent validity, as measured by the correlation between CTS2 short and full forms by each subscale, range from 0.65 to 0.94 (Straus & Douglas, 2004).

Quality of relationship with the father of the child (T2). Mothers’ perceptions of the quality of the relationship with their child’s father were assessed with the Quality of Relationships Inventory (QRI; Pierce, Sarason, & Sarason, 1991). This 25-item self-report questionnaire explores mothers’ perceptions of the quality of the relationship with the child’s father. The subscales included in this study are (a) Support Availability and Reliability (e.g., “To what extent can you turn to the father of your child for advice about problems?”), (b) Amount of Conflict (e.g., “How often do you have to work hard to avoid conflict with this person?”), and (c) Depth (relationship closeness and importance, e.g., “How much do you depend on this person?”). Mothers answered the questions on scale of 0 (not at all, 1 (a little), 2 (quite a bit), and 3 (very much). The QRI has good reliability, validity, and test-retest stability (Verhofstadt, Buysse, Rosseel, & Peene, 2006); α coefficients for the three subscales range from 0.83 to 0.88 for mothers and from 0.86 to 0.88 for fathers (Pierce et al., 1991). Psychometric studies among couples have shown high correlations between subscales for men and women, suggesting that QRI measures the same construct across genders (Verhofstadt et al., 2006).

Analyses
To identify patterns of mother–child EA, agglomerative hierarchical cluster analysis was conducted using SPSS Version 22.0. This procedure identifies groups (clusters) of cases that are similar to each other and different to other cases of a given sample. The distance between clusters was defined as the difference between centroids (cluster average) of each cluster. Based on the hierarchical cluster dendrogram, a four-cluster solution was selected as the best fitting model. Accordingly, a four groups k-means cluster analysis was used to estimate cluster means and assign each case to the group for which its distance to the cluster mean is the smallest. The distance between initial centers was 4.017, and all cases were assigned to clusters in a total of nine iterations. The variables used were previously standardized in both procedures.

After cluster identification, the association of clusters with maternal history, maternal parenting characteristics, and the dyads’ context of relationships was examined using analysis of variance followed by Tukey tests (continuous variables) and chi-square analysis (categorical variables). Variables assessed children’s age, maternal childhood history, parenting attitudes, conflict and quality of their relationships with their babies’ fathers, mothers’ participation in the home-visiting program (number of received home visits), and living arrangements.

RESULTS
The following paragraphs first present a description of the four groups of mother–child EA patterns identified by cluster analyses and then present a description of the association of the EA patterns with maternal history, parenting characteristics, and dyads’ context of relationships. The dyadic EA of the four groups obtained were labeled as follows: low-functioning dyads (Cluster 1), high-functioning dyads (Cluster 2), low-functioning dyads with nonhostile mothers (Cluster 3), and inconsistently sensitive mother and responsive child dyads (Cluster 4). Each group and its mean EA scores are presented in Figure 1 and Table 1, respectively. Each group’s association with contextual variables is shown in Table 2.

Cluster 1: Low-Functioning Dyads
Cluster 1, the low-functioning dyads, was the smallest group with a total of 25 dyads; mothers’ and children’s mean EA scores were the lowest of the sample, and all of them fell below the cutoff score for nonoptimal interaction, meaning that mother–infant interaction was nonoptimal. On average, mothers showed insensitive behavior characterized by unresponsiveness to the child’s communications coupled with overly hostile behavior. The children’s emotional and behavioral responses to their mothers were characterized by a lack of balance between autonomous pursuits and responsive
FIGURE 1. The four subtypes based on patterns of emotional availability behavior.

TABLE 1. Means of Child and Mother Emotional Availability Scales by Cluster

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Sample (M range)</th>
<th>Analysis of Variance (F(df))</th>
<th>1 (M range)</th>
<th>2 (M range)</th>
<th>3 (M range)</th>
<th>4 (M range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother Sensitivity</td>
<td>4 (1.5–7.5)</td>
<td>112.27**/3</td>
<td>3.26^3,4</td>
<td>5.83^1,3,4</td>
<td>4.08^1,2,4</td>
<td>4.78^1,2,3</td>
</tr>
<tr>
<td>Mother Nonhostility</td>
<td>3 (1–5)</td>
<td>182.81**/3</td>
<td>2.76^3,4</td>
<td>4.81^1,3,4</td>
<td>4.11^1,2,4</td>
<td>3.73^1,2,3</td>
</tr>
<tr>
<td>Child Responsiveness</td>
<td>4 (1–7)</td>
<td>85.17**/3</td>
<td>2.58^2,4</td>
<td>4.13^1,3,4</td>
<td>2.74^2,4</td>
<td>4.52^1,2,3</td>
</tr>
</tbody>
</table>

Note: Superscripts indicate clusters that are significantly different (p < .05).

*Scores at cutoff and below indicate nonoptimal emotional availability.

**p < .001.

behaviors toward the mother; the child responses may have included avoidance behavior and/or strong negative affect.

Mothers in this group had the sample’s lowest scores in parenting attitudes regarding the power and independence that they allow to their children (M = 4.76, SD = 1.84), and were more likely to use psychological aggression in the resolution of conflicts with their children (69.6%). Mothers also reported little depth (lowest in the sample) in their relationship with the baby’s father (M = 1.28, SD = 1.14). The hostile behavior evident in the mother–child interaction also was present in this group’s mother–father relationship; up to 32% of the mothers reported that their partners had inflicted minor injuries on them, and 36% had been victims of severe physical assault (Ms = 20.7 and 27, respectively). In both cases, these rates were the highest of the sample. Only 16% of the mothers in this group lived with the father of their child.

Cluster 2: High-Functioning Dyads

Cluster 2, the high-functioning dyads, was the largest with 79 dyads. Maternal and child mean EA scores were the highest of the sample and were in the optimal range for EA (above the cutoff score). These mothers interacted with their children in a mostly sensitive way, with some inconsistency, and did not show hostile behaviors. Children were responsive, and although they showed some positive emotion, their affective tone was somewhat bland or unenthusiastic.
TABLE 2. Variables Means and Frequencies by Cluster

<table>
<thead>
<tr>
<th>Overall Sample</th>
<th>Cluster 1 (n = 25)</th>
<th>Cluster 2 (n = 79)</th>
<th>Cluster 3 (n = 75)</th>
<th>Cluster 4 (n = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age (in months)</td>
<td>F/df</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>AAPI Reversing Parent–Child Roles Subscale</td>
<td>3.69/3</td>
<td>5.33</td>
<td>2.32</td>
<td>5.29</td>
</tr>
<tr>
<td>AAPI Oppressing Power and Independence Subscale</td>
<td>2.81/3</td>
<td>5.76</td>
<td>1.75</td>
<td>4.76</td>
</tr>
<tr>
<td>QRI Depth Subscale</td>
<td>2.75/3</td>
<td>1.81</td>
<td>1.10</td>
<td>1.28</td>
</tr>
<tr>
<td>Home Visits Cumulative</td>
<td>2.20/3</td>
<td>20.15</td>
<td>15.23</td>
<td>18.00</td>
</tr>
</tbody>
</table>

Note. Superscripts indicate clusters that are different from one another (p < .05). AAPI = Adult Adolescent Parenting Inventory; QRI = Quality of Relationships Inventory; CTS = Conflict Tactics Scales.

In comparison to the other groups, this group of mothers had the highest score in their parenting attitude regarding role reversal (M = 5.73, SD = 2.52) (i.e., they were least role-reversing). Mothers in the home-visiting program were receiving the least number of home visits (M = 15.85, SD = 12.97). Mothers’ recall of childhood physical assault by their parents was the lowest of the whole sample, yet 68% recalled having had at least one experience of this kind (M = 78.4).

Cluster 3: Low-Functioning Dyads With Nonhostile Mother

EA scores of the 74 mothers in this group were below the overall sample average, except for the distinguishing characteristic of nonhostility that was above the nonoptimal cutoff. Mothers showed insensitive behavior in the interaction, coupled with slight covert hostility. As in Cluster 1, children’s responses were nonoptimal, with an average score below the cutoff for optimal interaction and below the sample’s average score. These children showed either avoidant behaviors or strong negative affect, or there was very little interaction between mother and child.

This group received the highest number of visits from the home-visiting program (M = 23.71, SD = 14.15), and the children were the sample’s youngest (M = 10.08, SD = 4.22). Compared to other mothers, mothers in this group were more likely to live with their parents (80%), and almost half (44%) lived with the father of their baby. These mothers were the least likely to use psychological aggression (36%) or corporal punishment (8%) in mother–child conflict resolution, but they also reported the lowest use of nonviolent discipline strategies (8%). In father–mother conflict resolution, 15% of the mothers reported having had minor injuries inflicted by their partners, and 6.9% of them had experienced severe physical assault; both rates were the lowest of the sample.

Cluster 4: Inconsistently Sensitive Mother and Responsive Child

The group in Cluster 4 (n = 47 dyads) was characterized by scores above the cutoff for nonoptimal interaction, but mothers showed inconsistent sensitive behavior coupled with covert hostility. On average, children in this group showed a responsive quality with positive affect involved. The children in this group were the sample’s oldest (M = 14.40, SD = 5.73); mothers’ parenting attitudes regarding role reversal were the lowest of the sample (M = 4.26, SD = 2.11), meaning that they were the most role-reversing. These...
mothers had the sample’s highest score in the perception of depth in the mother–father relationship \( (M = 2.06, SD = 0.97) \). Almost all (90%) recalled having experienced physical assault by their parents during their childhood (the sample’s highest), and they were the most likely (50%) to use corporal punishment with their own children.

**DISCUSSION**

This study explored EA in interaction between adolescent mothers and their infants, characterizing the relational qualities of EA by taking a dyadic approach. The goals of the investigation were to both replicate and expand earlier work that took a relational analytic approach (Easterbrooks et al., 2005) to a larger sample \( (N = 226 \text{ dyads}) \) and to examine how different patterns of EA in mother–infant dyads emerged within their ecological contexts. Contextual characteristics investigated in this study included proximal characteristics of mothers (e.g., attitudes about parenting) and more distal characteristics (e.g., support and conflict in the mother–father relationship, living arrangements).

Four distinct dyadic patterns of EA were identified: (a) high-functioning dyads, (b) low-functioning dyads, (c) low-functioning dyads with nonhostile mother, and (d) dyads with inconsistently sensitive mother and responsive child. These findings suggest that although stereotypic views of adolescent mothers are often uniformly negative, mother–infant interactions have diverse expressions, as is the case with older mothers. The diversity of mother–infant interactions can be better understood in light of the mothers’ history and parenting characteristics, and the dyads’ context of relationships. In this study, mothers’ parenting attitudes, their strategies in the resolution of conflicts with their children and partners, and the dyads’ living arrangements showed significant association with patterns of dyadic EA.

**Patterns of Dyadic EA: Description and Associations with Maternal Parenting Characteristics and Dyads’ Context of Relationships**

Of the four EA patterns, the one of greatest concern is the low-functioning dyads group, in which both mothers and infants showed levels of EA that were far from optimal. These dyads were emotionally disconnected, and overt hostility was present during their interaction. A possible source of mother–infant conflict might be the emergent toddlers’ expressions of independence; mothers in this group held attitudes consonant with a belief in oppressing the child’s power and independence. The scores of these mothers on items such as “Parents who encourage their children to talk to them only end up listening to complaints” reflected deficiencies in appropriate parenting behaviors in this area. In addition, these mothers were most likely to report using psychological aggression in mother–infant conflict resolution (e.g., “threatened to spank or hit your child but did not actually do it;” “shouted, yelled, or screamed at your child”) and to react harshly, threatening or frightening their children, despite the child’s young age (average age = 12 months). Children in this group, as interactive partners, showed negative or bland affect, and the balance between exploration and connection was not adequate. These mothers might not support their children’s need for self-assertiveness and desire for autonomy; it is possible that they were emotionally connected in a frightening-frightened way. Past literature has noted that in these cases, the development of disorganized attachment is a distinct possibility (Abrams, Rifkin & Hesse, 2006; Hesse & Main, 2006; Lyons-Ruth, Bronfman, & Parsons, 1999). The interaction of one dyad is described by the EA coder’s comments:

Mom actively tries to set up the play, but doesn’t allow any exploration. She is unable to acknowledge her child’s wants. Mom actively bothered her child by repeating the behavior that the child was bothered by. Mom comments sarcastically, “You are such a brat.” She shows the cup to the child but takes it away from her; the child cries and mom smiles about her child being frustrated. The child shows very little eye contact and vocalizations. The child moves away from mom, mom brings child back, and child looks distressed.

There are some similarities between the EA scores of dyads in Clusters 1 and 3, the low-functioning dyads with nonhostile mother. Mothers in Cluster 3 also showed insensitive behavior with their children; however, there was some warmth in their interaction. On the other hand, the child’s responsiveness was low, similar to infants in Cluster 1; children were bland or negative in affect, or were “on their own” in the presence of the mother. It is possible that mothers found it difficult to read their children’s communication signals; Cluster 3 children were the youngest of the sample, on average 10 months old, and communication signals may have been less clear. At the same time, data on maternal–infant conflict resolution raises the possibility that these mothers are disengaged from interaction with their children. Although these mothers reported the lowest use of psychological aggression or corporal punishment (perhaps because of the children’s young age), they also were less likely to use nonviolent discipline strategies, which could be a signal of maternal disengagement from the relationship. An example of mother–infant interaction in this group is described by an EAS coder’s comment:

Mom’s task has become mom making him “do” the task rather than having him engaged in it. The interaction lacks enjoyment. Mom is not creative in ways to attract her child to the task, and she is unable to respond to his fussiness and disinterest. The child lets mom manipulate his hands; there is no response to tickles and he smirks to kicking the ball.

Dyads in both Clusters 1 and 3 were most likely to be living with the maternal grandparents. This finding could partially explain their low EA. For instance, mothers in both groups might share the caregiving role with their own mothers, or grandmothers may be the primary caregivers. Yet, the two groups differed in the emotional climate of the interaction, which was characterized by overt maternal hostility in Cluster 1. These groups are further differentiated by experiences of intimate partner violence (IPV). Mothers in Cluster 1 showed the highest rate of physical assault (e.g., “My partner pushed, shoved, or slapped me.”) and minor
injuries by their partners (e.g., “I had a sprain, bruise, or small cut, or felt pain the next day because of a fight with my partner.”). Mothers in Cluster 3 were the least likely of the sample to experience physical assault and minor injuries due to partner conflict. This finding supports the “spillover” theory, in that mothers’ experience of IPV in Cluster 1 might influence the mother–child relationship by direct transfer of mood, affect, or behavior from one setting to another (Erel & Burman, 1995; Levendosky & Graham-Bermann, 2000).

More positive patterns of EA were observed among two groups of dyads (Clusters 2 and 4). Despite this commonality, they demonstrated quite different patterns of emotional communication. One group (Cluster 4) was characterized by lack of coherence between maternal and child behavior, in which mothers showed inconsistent or “apparent” sensitivity toward their children (Biringen et al., 1998), yet children were highly responsive. In Cluster 2, mothers were the most sensitive of the sample, but their children were in the middle range of responsiveness.

Biringen et al. (1998) described three types of inconsistencies; all can be seen among mothers in Cluster 4. The first type of inconsistency is present when the mother behaviorally does what is “good” for the child, but this behavior is belied by affect that is not positive. The second inconsistency is the opposite, when mothers’ affect is positive, but she fails to do what is ultimately “good” for the child (e.g., using controlling or infantilizing strategies). The third pattern is one of asynchronous maternal sensitivity and child responsiveness, with one high and the other low (Biringen et al., 1998). In Cluster 4, the average child’s responsiveness in the interaction was the highest of the whole sample; nevertheless, the scores were only approaching the optimal range, raising concern about the level of child responsiveness across the entire sample. In Cluster 4, children showed positive affect in the interaction, but they did not demonstrate a good balance between autonomous pursuits and responsiveness toward their mothers. This lack of balance could be understood as a result of mothers’ inconsistent sensitivity (e.g., the child could have been overly connected to the mother if she tended to infantilize the child or the child could have been more autonomous than desired if the mother tended to overly control the interaction). The following EAS coder’s comment provides an example of this group’s interaction:

Mom comments: “You are not paying attention to mommy” “I’m bringing your toy because you want everything other than me.” “You are gonna make mama’s arm tired.”

Mothers in the high-functioning dyads group (Cluster 2) were the most sensitive and nonhostile of the sample. Their attitudes were consistent with their behavior; they understood their protective, educative, and nurturing role as parents. However, these mothers’ sensitivity had some level of inconsistency that might explain their children’s midrange scores in child responsiveness. The EAS coder’s notes on mother–infant interaction provide an example:

Role of the Home-Visiting Program

In addition to examining mothers’ parenting attitudes and characteristics of the mother–father relationship, among mothers enrolled in the home-visiting program, we examined whether the EA clusters were differentiated by home-visit frequency. One of the program goals is to promote positive parenting and well-being. Addressing this need through home visits, the number of visits per family will vary depending on the dyads’ needs. In this sample, the number of home visits ranged from 1 to 55 (average = 19) per dyad, from the time they enrolled in the program until the mother–infant observations 12 months later.

Despite the fact that the hostility and low sensitivity of the low-functioning dyads (Cluster 1) likely would have been of concern to the program home visitors, these mothers received fewer home visits than the average. Conceivably, mothers in this group rejected home visits because of concerns about surveillance, as home visitors are mandated reporters of maltreatment. Mothers in the low-functioning non-hostile group, on the other hand, received the sample’s greatest number of home visits. Perhaps they were more open to receiving home visits because surveillance issues were less threatening since they did not use corporal punishment or psychological aggression. It is not surprising that the group receiving the fewest number of home visits was the high-functioning
### TABLE 3. Comparison of Children’s and Mothers’ Emotional Availability From Different Studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample Qualities</th>
<th>Age</th>
<th>Context</th>
<th>Population</th>
<th>EAS Maternal Sensitivity M</th>
<th>EAS Maternal Nonhostility M</th>
<th>EAS Child R. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bornstein et al. (2010)</td>
<td>220 Mother–Child Dyads</td>
<td>5 and 20 Months</td>
<td>10- to 15-Min Free Play</td>
<td>Rural and Urban Areas. Diverse SES. U.S., Argentina, and Italy</td>
<td>6.44 (5 months)</td>
<td>4.8 (5 months)</td>
<td>5.19 (5 months)</td>
</tr>
<tr>
<td>Chaudhuri et al. (2009)</td>
<td>313 Mother–Child Dyads</td>
<td>14 and 20 Months</td>
<td>5-Min Free Play and 5-Min Teaching Task</td>
<td>Low SES. U.S. Young Mothers (&lt;21 years old)</td>
<td>6.20 (20 months)</td>
<td>4.75 (20 months)</td>
<td>5.06 (20 months)</td>
</tr>
<tr>
<td>Timmer et al. (2012)</td>
<td>232 Mother–Child Dyads</td>
<td>2–7 Years</td>
<td>5-Min Structured Situations</td>
<td>Low SES. U.S. Disruptive Behavior Problems</td>
<td>4.7</td>
<td>4.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Present Study</td>
<td>226 Mother–Child Dyads</td>
<td>5–27 Months</td>
<td>5-Min Free Play and 5-Min Teaching Task</td>
<td>Low SES. U.S. Young Mothers (&lt;22 years old)</td>
<td>4.75</td>
<td>4.13</td>
<td>3.58</td>
</tr>
</tbody>
</table>

EAS = Emotional Availability Scales; SES = socioeconomic status.

In the current sample, parenting attitudes reflected difficulties/deficiencies in areas of parent–child role reversal and supporting child autonomy. As a group, mothers had difficulty in their nurturing and protective role as parents and had insufficient understanding of their children’s need for autonomy and self-assertion, and this may have been expressed in their inconsistent sensitivity/lack of EA in mother–infant interaction. In the same vein, the reported tactics for conflict resolution indicate that almost half (48.5%) of the mothers in the sample had used psychological aggression toward their children at least once (even at such an early age), and one third (32%) had used corporal punishment. When looking at maternal history, it is observed that the practice of these tactics goes beyond the parent–child relationship indicating a possible transgenerational component in this behavior, as 78.4% of the mothers reported at least one experience of physical assault by their parents during their own childhood. Given the early comparison of our sample to a clinical risk sample (Timmer et al., 2012), we noted a concern that some of these dyads may continue to experience asynchronous mother–child interactions, resulting in problems in children’s behavioral regulation.

#### Limitations of the Study

One limitation of this study focuses on measurement of the dyadic perspective, specifically, in assessing each member’s characteristics and context. In exploring this association, the study fails to include children’s personal characteristics (e.g., temperament or sensory processing) that might influence child–mother interaction (Gudmundson & Leerkes, 2012; Mangelsdorf et al., 1990). Thus, a better understanding of these dyads’ interaction could have been achieved if both members of the dyads’ personal characteristics had been explored.

In studies on EA, the length of observation is sometimes mentioned as a limitation, given that a longer period of observation (≥30 min) has been suggested to truly understand EA (Biringen...
et al., 2005) and to allow time for “leakage” of negative behavior. At first glance, this does not seem to be a limitation in the present study since there was considerable negativity expressed in the interaction. However, this sample’s likelihood of mothers using psychological aggression (48%) and corporal punishment (32%) in the resolution of daily conflicts suggests that the hostile behavior observed in mother–infant interaction (on average, covert hostility) may not be representative of the more negative behaviors mothers report and that periods of observation longer than 10 min may be required, given the low frequency of occurrence (Bretherton, 2000).

Clinical Implications

This study makes a contribution to the understanding of the mother–child relationship from a systemic and relational perspective, as it studies the dyad as a unit rather than its members as individuals. In this particular view, the study identifies different patterns of interaction among young mothers and their infants, documenting that they are not a homogeneous group as is sometimes portrayed. As such, this study offers valuable information to individualize the clinical work and the supportive and preventive interventions with young mother–infant dyads, but the “lessons learned” need not be limited to adolescent mothers.

Identifying patterns of EA and their associations with maternal history, parenting attitudes and behaviors, and dyads’ context of relationships may contribute to the understanding of any mother–infant dyad and the development of programs, treatment approaches, and policies aimed at supporting mothers and infants at high social risk. In the case of home-visiting programs, the work with mothers and children in their homes involves an individual look at each dyad. The possibility of supporting the dyad and understanding mother–child relationships involves the home visitor’s ability to see their particular needs and specific contexts (e.g., the extent to which they share their children’s caregiving, their current and past history of IPV) (Astuto & Allen, 2009). In this regard, intervention programs must consider the dyad-context system to better address particular needs and to tailor intervention services.

Our findings also suggest that the exploration of mothers’ parenting attitudes and beliefs underlying their parenting behaviors may lead to a better understanding of mother–infant interaction and their relationship. Programs’ providers may want to explore mothers’ beliefs and their understanding of children’s normative development and to normalize behaviors that might be seen as atypical or undesirable by some mothers (e.g., desire for self-assertiveness, need for a protector and nurturing figure). Home visitors could normalize children’s need for exploration of the world while having their mothers as a secure base, meaning that they support their children’s exploration as well as welcome their children when they need comfort (Cassidy & Shaver, 2008). At the same time, home visitors could elicit conversations that promote mothers’ reflective function—mothers’ understanding of both their own and their children’s thoughts, feelings, and desires (Fonagy, Gergely, Jurist, & Target, 2002)—that help to make meaning of mothers’ and children’s behaviors and, hence, better support them in their interaction. Finally, for those specifically interested in EA-based interventions, there are several such interventions that show promise as evidence-based practices meant to increase parents’ or childcare providers’ EA in an effort to support positive interactions with young children (Baker, Biringen, Meyer-Parsons & Schneider, 2015; Biringen et al., 2010; Biringen et al., 2012).

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