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SPECIAL SECTION COMMENTARY

A developmental psychopathology perspective on emotional availability research: Current trends and challenges

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Abstract

Studies using the Emotional Availability Scales have burgeoned in the past decade. The collection of papers included in this Special Section represents the latest innovations in research with this paradigm. Consistent with a developmental psychopathology perspective, these papers evaluate emotional availability in a variety of typical, at-risk, international, and intergenerational samples of children and caregivers, with many utilizing longitudinal designs or employing measures from multiple levels of analysis. One study begins to translate findings from this body of research into a promising intervention program. Although further growth and refinement in research with this paradigm is needed, the results to date begin to place the construct of emotional availability into a complex, dynamic biopsychosocial context, and promise to inspire a new generation of studies. In this commentary, some of the key contributions and challenges of this collection of studies are highlighted using a developmental psychopathology framework.

Since its formal introduction to the field in the mid-1980s (Cicchetti, 1984; Sroufe & Rutter, 1984), the integrative discipline of developmental psychopathology has grown and proliferated, influencing the scope and design of broad areas of research in human development (Cicchetti & Toth, 2009). A primary goal of this discipline is to unify findings from diverse areas of developmental research conducted at multiple levels of analysis in order to shed light on individual differences in trajectories of normative and pathological functioning and their interplay during ontogeny, and to evaluate how transacting biological, psychological, and social–contextual factors may alter them (Cicchetti, 1993; Cicchetti & Toth, 2009; Rutter & Sroufe, 2000; Sroufe, 1990, 2007).

A striking illustration of the putative influence of this discipline comes from the growing body of research on the construct of emotional availability, as measured with the Emotional Availability (EA) Scales (Biringen, 2008; Biringen, Robinson, & Emde, 1998). As detailed by Biringen and Easterbrooks (2012), the construct of EA is multifaceted and dyadic in nature, and is rooted in attachment theory and systemic perspectives on development. EA refers to the quality of emotional attunement established and maintained between each partner during dyadic social interaction. Measurement of EA is accomplished using the EA Scales, which include four global ratings of caregiver behavior (sensitivity, structuring, nonintrusiveness, and nonhostility) and two global ratings of child behavior (responsiveness and involvement of the caregiver), each of which are assessed in dyadic context (Biringen & Easterbrooks, 2012). Although most studies using the EA Scales to date have focused on parent–child relationships during infancy and childhood, the construct is relevant to dyadic relationships across the life span.

It is notable that the EA Scales differ in level of analysis from other microanalytic measures of dyadic synchrony and contingent responsivity. The latter measures focus on the temporal coordination of discrete infant and caregiver social behaviors (e.g., Beebe et al., 2010; Beeghly, Fuertes, Liu, Delonis, & Tronick, 2011; Feldman, 2007; Kochanska, Aksan, Prisco, & Adams, 2008; Weinberg, Olson, Beeghly, & Tronick, 2006; Yale, Messinger, Cobo-Lewis, & Delgado, 2003; see also Tronick & Beeghly, 2011).

In their introductory editorial to this Special Section, Biringen and Easterbrooks (2012) note how research on EA has virtually exploded during the past decade, with over 100 empirical studies and reviews published to date. As is often the case when a new research paradigm is first evaluated, early studies using the EA Scales utilized cross-sectional or short-term longitudinal designs and focused on relatively small, homogeneous samples of typically developing children and their mothers (Biringen & Easterbrooks, 2012; Biringen & Robinson, 1991; Emde & Easterbrooks, 1985). Over time, however, the design and content of individual studies have broadened, and researchers have increasingly evaluated EA in diverse at-risk caregiver–child cohorts, at multiple ages, and in a variety of contexts, including international settings (for reviews, see Biringen, 2000; Easterbrooks

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& Biringen, 2000, 2005, 2009). The papers on EA included in this Special Section represent the latest innovations in research with this paradigm. Although much work remains to be done, these studies collectively illustrate how research on EA has expanded to incorporate research methods that are increasingly consistent with those utilized in studies explicitly adopting a developmental psychopathology perspective.

The key tenets and caveats of a developmental psychopathology approach have been cogently described in detail elsewhere (for a recent review, see Cicchetti and Toth, 2009). These are briefly summarized here in order to provide an organizational framework in which to discuss the contributions of specific papers included this Special Section. A primary tenet is that research guided by a developmental psychopathology perspective examines the complex, dynamic processes underlying the interplay between adaptive and maladaptive functioning over the life span. Another tenet is that research in this discipline is interdisciplinary in nature and incorporates measures from multiple levels of analyses (biologic, psychological, and social–contextual). A related caveat is that studies guided by a developmental psychopathology framework must evaluate cultural influences on development, which are currently understudied. Finally, findings from research adopting a developmental psychopathology approach must be translated into practical applications and used to inform and guide developmentally and culturally sensitive intervention and prevention programs.

In this commentary, some of the key contributions and limitations of findings from the studies included in this Special Section are highlighted from a developmental psychopathology perspective, along with opportunities for future research. The majority of the studies included in this special edition address the first two tenets of a developmental psychopathology approach, at least in part, by evaluating EA in the context of adaptive and maladaptive functioning, and by including measures from multiple levels of analyses. However, only one of these studies evaluated physiological correlates of EA and none explicitly addressed cultural differences. Moreover, only one study (Biringen et al., 2012) evaluated an intervention program designed to translate findings on EA into practice.

When viewed collectively, however, these studies have succeeded in evaluating EA in a variety of typical, at-risk, international, and intergenerational samples of children and caregivers, and many have utilized longitudinal designs. Moreover, despite some methodological limitations, most have highlighted avenues for future research and have discussed implications of their findings for the development of practical applications, including prevention and intervention programs. Thus, when viewed together, findings from this collection of new studies have begun to place the construct of EA into a complex, dynamic biopsychosocial context, and hold the promise of inspiring a new generation of studies.

Killeen and Teti (2012) examined whether microlevel measures of maternal responsiveness to changing infant emotions, as assessed using prefrontal cortical EEG alpha asymmetry, were associated with behavioral measures of maternal EA during mother–infant play at 6 months, maternal reports of anxiety and depressive symptoms, maternal or reports of their own emotional experience in response to their infant's cues. Findings were complex and generally indicated that microlevel measures of mothers' empathetic, in the moment responsiveness to changes their infants' emotional displays, as measured by EEG "affective style" cannot fully predict mothers' EA with their infants. Rather, a *shift* toward greater relative right frontal activation was associated with more emotionally available parenting, lower maternal anxiety, and higher maternal reports of sadness, concern, irritability, and a lack of joy in response to seeing her own infant in distress.

The authors suggest that measures of mothers' capacity for change/flexibility in specific emotional contexts may provide the strongest assessment maternal empathetic responding to infant distress.

Five studies included in the special edition evaluated EA in at-risk mother–child dyads (three evaluated dyads from high-risk, low-income backgrounds, and two evaluated the effects of international adoption). In addition to EA, each of these studies also included other child and maternal measures, but the specific measures utilized in different studies varied, making direct comparisons difficult.

In longitudinal research, Stack et al. (2012) evaluated EA in two independent, at-risk, low-income Canadian samples of mothers and children. Notably, this is the first attempt to place EA in an intergenerational context. In their first study, Stack et al. (2012) evaluated dyads when children were preschool aged and again during middle childhood. In the second study, they evaluated dyads when children were 6 months, 12 months, and 18 months of age, and again when children were preschool aged and school aged. Results from both studies showed that mothers with a personal history of aggression and social withdrawal during their own childhoods exhibited higher levels of maternal hostility with their children at preschool age (but not at other ages). Findings from the first study, in addition, revealed that mothers with a history of social withdrawal during childhood had preschoolers who were less responsive to and involving of them during social interaction. Results from the second study revealed that a higher level of appropriate maternal structuring was associated with greater child responsiveness, and more maternal sensitivity and structuring were linked to more child involvement of the mother. Moreover, when age was controlled, better maternal psychosocial functioning (i.e., more maternal support and less maternal stress) and a higher quality home environment were related to more optimal patterns of EA. These results highlight that historical, environmental, and psychosocial variables all alter patterns of dyadic EA during social interaction in high-risk dyads with preschool aged children.

In cross-sectional research, Timmer, Thompson, Culver, Urquiza, and Altenhofen (2012) evaluated EA in a large sample ($N = 234$) of at-risk, clinic-referred 2- to 7-year-old children and their biological mothers in three observational

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contexts: child-directed interaction, parent-directed interaction, and a clean-up task. Mothers also provided information about demographics and reported on their current level of parenting stress. Dyads were classified into four groups for analytic purposes: about one-quarter of the children had been physically abused by their mothers, and about half of these children had, in addition, been exposed to interparental violence in the home (double-jeopardy group). The remainder of the children had no history of physical abuse.

Findings from mothers' self-reported parenting stress revealed a pattern of results consistent with a cumulative risk hypothesis: mothers in the double-jeopardy group reported higher stress associated with the parent–child relationship and with difficult child behaviors than mothers in the other groups. However, contrasting findings were found in the behavioral analyses. Significant interactions between physical abuse and interparental violence status were observed, but counterintuitively, only in the child-directed context. Mothers in the abuse-only group exhibited the least sensitivity and the most hostility, compared to mothers in the other groups, and their children exhibited the least responsiveness and involvement. However, dyads in the double-jeopardy group did not exhibit the least optimal patterns of EA. Subsequent analyses were conducted that revealed that dyads in the double-jeopardy group showed signs of overresponsiveness in the face of mothers' low EA, a pattern the authors suggest is reminiscent of those exhibited by children with a disorganized attachment style. The authors are rightfully cautious in interpreting the complex behavioral results, while pointing out the many limitations of the study. They also suggest that measures of participants' mental representations of their relationships may have shed further light on the complex pattern of results, and should be included in future studies with maltreated children, in addition to behavioral measures.

Easterbrooks, Bureau, and Lyons-Ruth (2012) evaluated correlates of EA in a small longitudinal sample of high-risk, low-income mother–child dyads followed from infancy to middle childhood (7 years of age). Results revealed that specific indices of EA during middle childhood (maternal sensitivity and nonhostility) were related to concurrent measures of disorganized attachment, and with aspects of mothers' prior behavior with their infants during infancy (maternal hostility, disrupted communication). In turn, dimensions of EA during middle childhood (maternal sensitivity, nonhostility, and passive/withdrawn behavior) were associated with aspects of children's adaptive functioning beyond the mother–child relationship (externalizing and total behavior problems in school; depressive symptoms). Although the longitudinal sample suffered from significant attrition, which limits interpretation, the results provide at least preliminary evidence for the relative coherence of different measures of the mother–child relationship from infancy to middle chlldhood and provide important validity information for the measures of EA and attachment during middle childhood. In their discussion of their findings, Easterbrooks et al. (2012) make the compelling suggestion that the experience of sharing positive or negative affect with a caregiver may be a powerful organizer of "meaning-making," both with respect to the self and the mother–child relationship (see also Tronick & Beeghly, 2011), and may be an explanatory mechanism underlying the relative coherence of dyadic measures observed in this longitudinal sample of at-risk dyads.

Two papers included in the special edition focus on EA in at-risk samples of internationally adopted children and their parents. Internationally adopted children are known to be at increased risk for nonoptimal social relationships with parents and peers, and for delayed or atypical social understanding. Most studies have focused on preadoption conditions, such as quality of institutional rearing, country of origin, and age at adoption as early predictors of these problems. Relatively few studies have evaluated whether the quality of parenting children receive following adoption moderates the negative effects of early adverse care in this population.

In a longitudinal study based in the United States, Garvin, Tarullo, van Ryzin, and Gunnar (2012) evaluated whether EA during mother–child interaction at 18 months would moderate aspects of functioning shown to be impaired in postinstitutionalized children in other studies: social understanding (joint attention) at 18 months, children's indiscriminant friendliness at 30 months, and children's emotional understanding at 36 months. As predicted, more optimal patterns of EA were associated with more advanced emotion understanding at 36 months. In addition, a significant interaction between group, children's tendency to initiate joint attention with an examiner and EA at 18 months was found that predicted indiscriminate friendliness at 30 months. Specifically, for children in the postinstitutionalized group only, higher EA scores reduced the negative association between a tendency to initiate joint attention with the examiner and later indiscriminate friendliness.

In a short-term longitudinal study based in The Netherlands, van den Dries, Juffer, van IJzendoorn, Bakermans-Kranenburg, and Alink (2012) evaluated associations among EA, attachment, and indiscriminant friendliness in 92 families with children who had been internationally adopted during toddlerhood in China, either from institutions or from foster families. Mother–child dyads were evaluated 2 and 6 months following adoption. Adoptive mothers of children from both postinstitutionalized and former foster care families were equally sensitive to their children during social interaction, and their sensitivity did not change over time. However, children who had been adopted from institutions were less likely to be securely attached than children in the other two groups, and children in both adopted groups exhibited a higher rate of disorganized attachments compared to normative data. Although children in the postinstitutionalized and former foster care groups did not differ on indiscriminate friendliness, children with more sensitive adoptive mothers exhibited less indiscriminate friendliness. Children in the former foster care group also showed a larger increase in responsiveness to their adoptive mothers over time compared to children in the postinstitutionalized group. Van den Dries et al. (2012) speculate that children's EA to their caregivers

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may be more amenable to change than attachment, and that preadoption foster care may protect against the negative effects of preadoption institutional care on the development of children's responsiveness after adoptive placement. Based on their findings, the investigators also suggest that early attachment-based interventions may be helpful in supporting the sensitivity of adoptive parents with their children and in decreasing the heightened rate of disorganized attachment observed in the adopted groups.

None of the studies included in this special section directly assessed the influence of cultural factors on EA, as mandated by a developmental psychopathology perspective. However, several studies evaluated EA in families with young children in different countries (Canada, The Netherlands, and the United States). In addition, two studies evaluated children adopted from international contexts into families in the United States or The Netherlands. The results of these studies implicitly suggest that EA ("emotional attunement") can be meaningfully assessed in these countries, but further research is needed to replicate these findings in non-Western as well as Western countries, and evaluate more explicitly the effects of cultural (and subcultural) differences on EA and its correlations with relevant measures of parental adaptation and child outcome. In other words, as stated by Biringen and Easterbrooks (2012), further work is needed to shed light on the "meaning" of EA in different cultures.

Only one study in this collection addressed the last tenet mandated by a developmental psychopathology approach, namely, the development and implementation of prevention and intervention programs based on findings from basic research. Biringen et al. (2012) took an important first step toward meeting this requirement by evaluating the efficacy of a multicenter training program designed to help child care professionals develop emotionally available relationships and improved attachment quality with the preschoolers in their care. In their study, roughly half of the professional caregivers participated in the intervention group, and half were assigned to a care as usual comparison group. The intervention involved an informational component (two, group-format psychoeducational trainings related to attachment and EA) and a practice component (three to four individualized sessions with an EA coach). Measures of EA, caregiver–child attachment, and classroom style were carried out both before and after the treatment/comparison conditions. Although the results of the intervention need replication in larger studies, the findings were promising: professional caregivers in the intervention group had more optimal change in scores on EA, attachment, and classroom style than caregivers in the comparison group, who in turn showed declines on some of these measures over the course of the study.

Although further growth and refinement in research with the EA Scales is needed, the results of studies conducted to date are intriguing and have begun to place the construct of EA into a complex, dynamic biopsychosocial context. Certainly, these results findings promise to inspire a new generation of studies. Arguably, a developmental psychopathology perspective can provide a useful framework for developing and implementing such studies.

For instance, because developmental psychopathology focuses on the study of adaptive and maladaptive functioning from the perspective of developing systems over the life span, and utilizes measures from multiple levels of analysis (Cicchetti & Toth, 2009), an important goal of research on EA might be to evaluate stability and change in adaptive and maladaptive aspects of EA across the life span, and to include measures of physiological/biological processes, cognitive, linguistic, and social–cognitive skills, and social–contextual factors that that are known to influence aspects of EA and relevant outcomes, as well as their dynamic interplay. Moreover, future research on EA should continue utilizing samples characterized as "experiments of nature" (e.g., children raised in institutional settings; children with a history of maltreatment), which can make significant contributions to our understanding of what is possible in normal ontogenesis.

In addition, a focus on stage-salient issues (age- and stage-appropriate developmental tasks) that are critical to adaptation throughout the life span might be promising "touchpoints" for assessing EA in future research. For instance, during infancy, the regulation of states, the emergence of intersubjectivity (e.g, joint attention), and the establishment of clear-cut attachment are important stage-salient tasks. Each of these salient issues requires competencies stemming from multiple developmental domains (e.g., biological, cognitive, socioemotional, motor, and social–cognitive). How do developmental transitions during these different "touchpoints" affect EA? During which stage-salient issues is the measurement of EA most predictive of later outcome?

Furthermore, future investigations of EA should incorporate cultural contexts into both the study design and treatment initiatives. By evaluating the impact of cultural differences in EA, it is possible to understand the specific developmental stages, sequences, and structures that are logically necessary and what alternate pathways are possible (Cicchetti & Toth, 2009). Finally, scientific discoveries about EA (both theory and empirical research) need to be translated into practical applications to time, guide, and inform more effective prevention and intervention programs for at-risk cohorts of caregivers and children.

Critically, these opportunities for future research come with important and challenging methodological caveats, as detailed by Cicchetti and Toth (2009). For instance, the assessment of EA and relevant indices of adjustment should be accomplished using measures from multiple levels of analysis, applied both simultaneously, and at repeated intervals during ontogeny (Cicchetti & Rogosch, 1996). Moreover, given that there is marked variability both within and between each relevant level of analysis (biological, psychological, social–contextual), it is important to evaluate individual trajectories of development (rather than, or in addition to, calculating and comparing group means).

Of course, implementation of these methodological caveats will require complex, sophisticated research designs and the

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use of increasingly complex causal models of development (e.g., the use of nonlinear as well as simple linear models of outcome; Cicchetti & Toth, 2009). Although complicated and even daunting, these models are consistent with those emerging in the broader field of developmental science. If implemented in the study of EA, these models and caveats promise a bright future for research programs and more effective treatment initiatives based on this construct.

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