
SPECIAL SECTION COMMENTARY

Emotional availability: Critical questions and research horizons

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Abstract

Based on attachment theory, the construct of emotional availability and its assessment goes beyond attachment in important ways. Its origins in clinical experience and emotions research are discussed as well as the prospects for continuing advances in knowledge stimulated by the contributions in the Special Section. This is especially so in terms of developmental variations and the biological underpinnings of emotional availability. A major need and opportunity also exists concerning research related to psychopathology, clinical interventions, and training.

As the contributions of this Special Section illustrate, emotional availability (EA) assessments and research findings have now led to a plethora of questions and some new vistas for development and psychopathology. Before plunging into these topics, however, let me highlight some thinking and its recent history.

Beyond Attachment

The EA Scales, centered in most of the contributions of this Special Section, although based on a foundation in attachment research and its focus on maternal sensitivity, go beyond that research in three important ways. First, the EA Scales are *explicitly dyadic*, with assessments of child as well of caretaker that result from their observed interactions. Second, the EA Scales include a second well-known major dimension of parenting (and indeed of human relationships in general). Thus, they include assessments of *parental structuring* as well as those of sensitivity. Third, evaluating EA goes beyond attachment in considering more than responses to the elicited emotion of fear (as observed prototypically in separation paradigms) and takes into account the communicative use of a *range of available emotions*, positive as well as negative (as observed in a variety of circumstances).

As mentioned in the introductory editorial to the Special Section, the concept of EA took roots in our group stimulated by compelling clinical as well as research observations. Moreover, the historical context for these observations occurred in the midst of a changing view about the role of emotions. It is perhaps difficult to imagine now, but in the 1960s and 1970s emotions were largely regarded as reactive, intermittent, and disruptive states arising during information

processing. Our experience was different and led to a contrasting view of emotions as active, ongoing, and adaptive processes in the midst of everyday life (see reviews in Emde, 1980a, 1980b, 1994; Emde & Sorce, 1983; Sorce & Emde, 1981). Clinical observations in psychoanalytic work as well as in pediatric settings indicated the essential importance of emotional communications, over time, in parenting as well as in helping relationships. Thus, availability for emotional responding seemed an important aspect of parental nurturance and guidance. Similarly, emotional responding seemed important for clinical engagement and understanding, a conclusion leading us to recommend “using your emotions” in psychoanalytic settings as well as in pediatric settings (Emde, 1988, 1990, 1991, 1998; Emde & Easterbrooks, 1985; Emde, Gaensbauer, & Harmon 1981). Research observations then served to confirm the salience of ongoing available emotional communications in studies of normal and Down syndrome infants and their families (Sorce & Emde, 1982). Moreover, such studies gave emphasis to another point. Not only was using a range of emotions important for communication, but also exchanging positive emotions seemed especially important for families and for child development (Emde, 1994; Emde, Gaensbauer, & Harmon 1976).¹ As today’s reader is sure to appreciate, our view of adaptive emotions, both for expression and communication, emerging in the 1960s took support from original ideas of Darwin (1872), much animal work (e.g., Hinde, 1974), as well as the pioneering crosscultural work of Ekman and Friesen (1975) and of Izard (1971), all of which now forms a common background for critically thinking about EA in the light of an array of new studies.

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1. The term *emotional availability* was taken from Margaret Mahler (Mahler, Pine, & Bergman, 1975) who used it as a useful metaphor to describe the role of the parent for the toddler and for later ages, when the parent served as “beacon of orientation” during times of separation and individuation. It is noteworthy that Mahler and colleagues also combined research observations with clinical experience to arrive at this concept.

Developmental Variations

Considering the adaptive nature of emotions and of emotion communication, it is not surprising that the studies in the Special Section tend to regard EA as a life span construct and that assessments of it are carried out at different ages, with most studies in infancy and early childhood, but with some others in middle childhood and even in adolescence. However, what EA looks like in the variations of adolescent life and in later development are as yet unanswered questions. A conceptual background for EA includes the view that autonomy and connectedness develop together, not separately or in sequence (Emde & Buchsbaum, 1990) and that the EA assessments presumably capture variations in both aspects (Biringen & Easterbrooks, 2012). To what extent would we expect variations in these aspects to change with adolescence and adult development? Concerning expectations, it is surprising that so much is made of the predictive connections between the measurements of EA and those of attachment. Why would one expect any tight connections, because the constructs and the circumstances of assessment are different? In contrast, perhaps one could expect some connections from manifestations of overlapping constructs, with mostly differences, which I suppose is reflected in the modest to low correlations found between measures of EA and attachment.

This raises issues of continuity. A number of the studies in this Journal's Special Section provide longitudinal data, and we are faced with questions of what we should expect. Development is characterized by increasingly organized complexity. How much continuity should we expect in the dimensions of EA as a function of the changing processes of development, in addition to the changing circumstances over time that any individual child experiences? Moreover, EA is a relational construct, and thus would be expected to vary in its assessment according to who is in the dyad. This leads to other questions. How much of EA resides in the child over time and how much resides in the partner? Further, how much continuity would one expect as a product of the relationship as contrasted with continuity within individuals? Do the dimensions of EA show different patterns of continuity and change? Some of the Special Section's contributions provide leads in beginning to answer such questions. Thus, two postadoption studies suggest dimensional differences in dyads depending on preadoption context and in which findings of caregiver sensitivity did not differ. Garvin, Tarullo, Van Ryzen, and Gunnar (2012), found that adoptive mothers of postinstitutionalized children were lower in the dimensions of structuring and nonintrusiveness (i.e., higher in intrusiveness) than were mothers of nonadopted children, suggesting child effects; additionally van den Dries, Juffer, van IJzendoorn, and Bakermans-Kranenburg (2012) found that child responsiveness improved in the postadoptive environment for those with a history of foster care rather than institutional care. In the child care worker EA intervention study, Biringen et al. (2012) found that outcomes included both measured enhanced child responsiveness and caregiver structuring as

assessed in the child care worker–child relationship, not sensitivity. Clearly, many questions remain about the sources of continuity and change that can only be answered by longitudinal studies of EA involving individual children and their differing relationships, in varying circumstances, over time.

Other questions concern measurement issues. To what extent are there halo effects from raters across the dimensional scales of EA confounding judgments as to their specificity and yielding spurious correlations between dimensions? Biringen (personal communication) has indicated that the fourth edition of the EA Scales involving a two-step strategy for coding is designed to minimize the problems suggested by this question. To what extent can one use only one or two dimensions of the EA Scales, for example, maternal sensitivity as in the van den Dries et al. (2012) study, and does doing so influence results, confounding matters, when making comparisons with results of others who have used all the dimensions of the EA Scales? Further does not the use of the term “maternal sensitivity” in EA, without clearly indicating it is a component of a specific dyadic system of assessment generate potential confusion when in the attachment literature the same phrase is used with different operational referents? How much does the context of measurement matter? It is the most intriguing that there is widespread cultural application of the EA scales. Although there is no standard interaction situation recommended for assessing EA, would the play paradigm of Timmer, Thompson, Culver, Urquiza, and Altenhofen (2012) reported in this Special Section (i.e., child-directed play, mother-directed play, and clean-up) be a useful standard in the future for making comparisons?

Biological Underpinnings

On the horizons of research, opportunities seem remarkably promising for understanding biological mechanisms underlying the development of capacities for emotional communication, emotional regulation, and EA. The contribution of Killeen and Teti (2012) indicating that more emotionally available mothers show more of a shift to right-brain activation when viewing videos of their infants in three different emotion states seems a start, but these findings are difficult to interpret, because this shift occurred irrespective of the valence of infant emotion. Beyond this initial study, however, I would think there are vast opportunities for research. Advances in genetics and the cognitive neurosciences can be highlighted, with some poignant examples taken from research in early development, an age period where most of the studies of this Special Section (and the work of others on EA) have been carried out. We know from the field of population genetics that normal variations in empathy and emotional aspects of temperament in early development have significant genetic influence (Kagan, Snidman, Kahn, & Towlsey, 2007; Zahn-Waxler, Robinson, & Emde, 1992). We also know, since the mapping of the human genome and the availability of genotyping, that physiologically relevant polymorphisms within individuals in association with

particular environmental events (e.g., child maltreatment, early stressors, and adversities) can sometimes predict variations in later behaviors of consequence (e.g., delinquency or depression as in Caspi et al., 2002, 2003). But matters are complex (Irizarry & Galbraith, 2004) and gene–environment interactions, with the many aspects of the mutual influences of early experience in “interplay” with genetic variation, are an active frontier of research.

Three features of work are salient for this discussion. First, many of the polymorphisms under investigation involve the regulation of emotion-related receptors and systems (e.g., serotonin transporter genes, dopamine receptor genes, and monoamine oxidase gene variants). Second, the early caregiving environment is found to be especially important in influencing variations in development with a recognized need for and better assessment of such environments to promote health and prevent illness (Shonkoff, Boyce, & McEwen, 2009). Third, there is a recognized need to take into account developmental change in gene–environment interactions, because risk factors for endophenotypes of disorder will be expected to vary with age (Lenroot & Giedd, 2011). All of this provides opportunities for interdisciplinary EA research, but there is more.

At the molecular level the horizons for new knowledge concerning EA are even more compelling. In the pioneering work of Meaney and colleagues (reviewed in Meaney, 2010), epigenetic changes in behavior across generations have been documented to occur from variations in maternal licking and grooming in rat pups (controlled through cross-fostering), changes that have been shown to be mediated by histone changes in the cell nucleus with changes in hypothalamic neuroreceptors, that in turn affect stress regulation. Thus, questions about human parallels with early caregiving and EA abound. To what extent could variations in early maternal EA set regulatory homeostatic systems, via epigenetic mechanisms, for later stress regulation in childhood and beyond? To what extent are parent factors, based on the neurobiological factors underlying EA, modifiable (see below)? More directly, recent work has opened up vistas relating to the variations in human neuropeptides, especially oxytocin and vasopressin, as they influence emotional aspects of early parenting, with many as yet unexplored implications for EA (Feldman, Weller, Zagoory-Sharon et al., 2007; Galbally, Lewis, vanIJzenendoorn, & Permezel, 2011; Taylor, Saphire-Berstein, & Seaman, 2010). Some of this work also links to the active research with neuroimaging, again with the discovery of individual differences underlying EA a prospect for the future (Strathearn, Fonagy, Amico, & Montague, 2009; Swain, Loberbaum, Kose, & Strathearn, 2007).

Psychopathology and Clinical Interventions

It would seem the time has now come for linking research involving variations in EA more directly with the development of psychopathology, especially because the biological underpinnings of EA become more apparent. Several disorders in

which emotion regulation and communication are prominent features of disturbance come to mind. Can assessments of EA, involving behavior and physiology, provide helpful clues to the early identification and treatment of autistic spectrum disorders? Can such assessments do the same for personality disorders, wherein hopeful variations in life course and treatment are being increasingly appreciated (Gunderson, 2011; Lenzenweger, 2010)? Can assessments of EA detect early extreme forms of psychopathy wherein amygdala and other physiological deficits may be apparent (Gao, Raine, Venables, Dawson, & Mednick, 2010; Yang, Raine, Narr, Colletti, & Toga, 2009)? More obviously, can the assessments of EA be helpful in the early identification and management of childhood anxiety and depressive disorders? On the parent side, it would seem a fruitful line of research would be to see if EA can predict mind-mindfulness as there is evidence that a low capacity for understanding the feelings and intentions of another is associated with the risk of depression (Barrett & Fleming, 2011).

Related to the above and our accumulating knowledge about parental stress and its effects on parental bonding and affectionate caring behaviors, is the intriguing literature suggesting programming effects of stress and anxiety during pregnancy on the later occurrence of childhood psychopathology. Especially noteworthy is the Avon longitudinal cohort study that has found associations of maternal prenatal stress and anxiety with childhood behavior problems at 4 and at 8 years of age, independent of maternal self-reported post-natal stress and anxiety (O'Connor, Heron, Golding, Glover, & The ALSPAC Study, 2003). Can assessments of EA be helpful in guiding early targeted interventions for children who are the offspring of high stress pregnancies?

What seems apparent to me is that to the extent to which EA assessments (including physiological assessments of relevance) are linked to early identification and risk factors for given psychiatric disorders, progress will be substantial, not only for advancing our knowledge but also for preventive interventions and early treatment. In other words, to the extent we can identify early risk factors for psychopathology that are moderated by (or even mediated by) EA, and to the extent we can reduce these risk factors, we can decrease the odds that disabling disorder will develop. The current trend in diagnostic classification, moving more toward a dimensional or spectrum model for psychopathology (Krueger & Markon, 2011), is in line with this way of thinking because it directs more attention to the early identification of alterable risk, prior to what might have heretofore awaited a categorical diagnosis of disorder.

My concluding research frontier has to do with the intriguing possibility of using knowledge of EA for intervention and training. Biringen and colleagues (2012) in this Special Section provide us with a brief EA-based intervention that yielded promising results in a randomized trial that targeted day care center workers. As they point out, it is perhaps not surprising that improvements in the short-term training intervention occurred in the EA dimension of “structuring” rather

than “sensitivity” because the former is based more on verbal–cognitive and conscious modes of interactions and the latter more on nonverbal and intuitive modes. Can this finding be replicated? If so, can the intervention be extended and manualized for use in other contexts, including those where major risk of adverse EA associated with psychopathology is identified? Could a longer or modified intervention see changes in sensitivity?

The intervention in the above study was not targeted for a problem group of children or caregiver–child interactions, but instead was instituted as a special form of training. This puts us in mind of frontiers of training now before us, with some wide-open questions waiting to be answered. To what extent

can training in EA evaluation contribute to the growing knowledge and practice concerning reflective supervision in the infant mental health field (Larrieu & Dickson, 2009)? Beyond this, to what extent can EA training and evaluation contribute to the identified needs for moving to a practice of medicine that is more personalized (Collins, 2010), integrated (Wennberg, 2010) and relationship based (Bortz, 2011)? It seems that if EA research can move vigorously in the direction of answering these questions, then the original promise of “using your emotions” in clinical practice and prevention might become more understood and evidence based, for work with development and with psychopathology.

References

- Barrett, J., & Fleming, A. S. (2011). All mothers are not created equal: Neural and psychobiological perspectives on mothering and the importance of individual differences [Annual research review]. *Journal of Child Psychology and Psychiatry*, *52*, 368–397.
- Biringen, Z., Altenhofen, S., Aberle, J., Baker, M., Brosal, A., Bennett, S., et al. (2012). Emotional availability, attachment, and intervention in center-based child care for infants and toddlers. *Development and Psychopathology*, *24*, 23–34.
- Biringen, Z., & Easterbrooks, A. (2012). Emotional availability: Concept, research, and window on development and psychopathology. *Development and Psychopathology*, *24*, 1–8.
- Bortz, W. M. (2011). *The next medicine: The science and civics of health*. New York: Oxford University Press.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I., et al. (2002). Evidence that the cycle of violence in maltreated children depends on genotype. *Science*, *297*, 851–854.
- Caspi, A., Sugden, M. B., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., et al. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, *301*, 386–389.
- Collins, F. S. (2010). *The language of life: DNA and the revolution in personalized medicine*. New York: Harper Collins.
- Darwin, C. (1872). *The expression of emotions in man and animals*. London: John Murray.
- Ekman, P., & Friesen, W. (1975). *Unmasking the face*. Englewood Cliffs, NJ: Prentice–Hall.
- Emde, R. N. (1990). Mobilizing fundamental modes of development—An essay on empathic availability and therapeutic action. *Journal of the American Psychoanalytic Association*, *38*, 881–913.
- Emde, R. N. (1980a). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In P. M. Taylor (Ed.), *Parent–infant relationships* (pp. 87–115). Orlando, FL: Grune & Stratton.
- Emde, R. N. (1980b). Levels of meaning for infant emotions: A biosocial view. In W. A. Collins (Ed.), *Development of cognition, affect and social relations. Minnesota symposia on child psychology* (Vol. 13, pp. 1–37). Hillsdale, NJ: Erlbaum.
- Emde, R. N. (1988). Development terminable and interminable: II. Recent psychoanalytic theory and therapeutic considerations. *International Journal of Psycho-Analysis*, *69*, 283–296.
- Emde, R. N. (1991). Positive emotions for psychoanalytic theory: Surprises from infancy research and new directions. *Journal of the American Psychoanalytic Association*, *39*(Suppl.), 5–44.
- Emde, R. N. (1992). Social referencing research: Uncertainty, self, and the search for meaning. In S. Feinman (Ed.), *Social referencing and the social construction of reality in infancy* (pp. 79–94). New York: Plenum Press.
- Emde, R. N. (1994). Individuality, context, and the search for meaning. *Child Development*, *65*, 719–737.
- Emde, R. N. (1998). Early emotional development: New modes of thinking for research and intervention. In J. G. Warhol (Ed.), *New perspectives in early emotional development* (pp. 29–45). San Francisco, CA: Johnson & Johnson Pediatric Institute.
- Emde, R. N., & Buchsbaum, H. K. (1990). “Didn’t you hear my mommy?”: Autonomy with connectedness in moral self emergence. In D. Cicchetti & M. Beeghly (Eds.), *Development of the self through the transition* (pp. 35–60). Chicago: University of Chicago Press.
- Emde, R. N., & Easterbrooks, M. A. (1985). Assessing emotional availability in early development. In W. K. Frankenburg, R. N. Emde, & J. W. Sullivan (Eds.), *Early identification of children at risk: An international perspective* (pp. 79–101). New York: Plenum Press.
- Emde, R. N., Gaensbauer, T. J., & Harmon, R. J. (1976). Emotional expression in infancy: A behavioral study. *Psychological Issues Monograph Series*, *10*(1, Serial No. 37).
- Emde, R. N., & Sorce, J. F. (1983). The rewards of infancy: Emotional availability and maternal referencing. In J. Call, E. Galenson, & R. Tyson (Eds.), *Frontiers of infant psychiatry* (pp. 17–30). New York: Basic Books.
- Emde, R. N., Gaensbauer, T. J., & Harmon, R. J. (1981). Using our emotions: Some principles for appraising emotional development and intervention. In M. Lewis, & L. Taft (Eds.), *Developmental disabilities in preschool children* (pp. 409–424). New York: S. P. Medical & Scientific Books.
- Feldman, R., Weller, A., Zagoory-Sharon, O., & Levine, A. (2007). Evidence for a neuroendocrinological foundation of human affiliation: Plasma oxytocin levels across pregnancy and the postpartum period predict mother–infant bonding. *Psychological Science*, *18*, 965–970.
- Galbally, M., Lewis, A. J., van IJzendoorn, M., & Permezel, M. (2011). The role of oxytocin in mother–infant relations: A systematic review of human studies. *Harvard Review of Psychiatry*, *19*, 1–14.
- Gao, Y., Raine, A., Venables, P. H., Dawson, M. E., & Mednick, S. A. (2010). Association of poor childhood fear conditioning and adult crime. *American Journal of Psychiatry*, *167*, 56–60.
- Garvin, M. C., Tarullo, A. R., Van Ryzen, M., & Gunnar, M. R. (2012). Post-adoption parenting and socioemotional development in postinstitutionalized children. *Development and Psychopathology*, *24*, 35–48.
- Gunderson, J. G., Stout, R. L., McGlashan, T. H., Shea, M. T., Morey, L. C., Grilo, C. M., et al. (2011). Ten year course of borderline personality disorder: Psychopathology and function from the collaborative longitudinal personality disorders study. *Archives of General Psychiatry*, *68*, 827–837.
- Hinde, R. A. (1974). *Biological bases of human social behavior*. New York: McGraw Hill.
- Irizarry, Y., & Galbraith, S. J. (2004). Complex disorders reloaded: Causality, action reaction, cause and effect. *Molecular Psychiatry*, *9*, 431–432.
- Izard, C. E. (1971). *The face of emotion*. Meredith, NY: Appleton–Century–Crofts.
- Kagan, J., Snidman, N., Kahn, V., & Towsley, S. (2007). The preservation of two infant temperaments into adolescence. *Monographs of the Society for Research in Child Development*, *72*, 1–93.
- Killeen, L. A., & Teti, D. M. (2012). Mothers’ front EEG asymmetry in response to infant emotion states and mother–infant emotional availability, emotional experience, and internalizing symptoms. *Development and Psychopathology*, *24*, 9–21.
- Krueger, R. F., & Markon, K. E. (2011). A dimensional-spectrum model of psychopathology: Progress and opportunities [Editorial]. *Archives of General Psychiatry*, *68*, 10–11.
- Larrieu, J. A., & Dickson, A. B. (2009). Reflective practice in infant mental health training and consultation. *Infant Mental Health Journal*, *30*, 579–590.

- Lenroot, R. K., & Giedd, J. N. (2011). Annual research review: Developmental considerations of gene by environment interactions. *Journal of Child Psychology and Psychiatry*, *52*, 429–441.
- Lenzenweger, M. F. (2010). Current status of the scientific study of the personality disorders: An overview of epidemiological, longitudinal, experimental psychopathology and neurobehavioral perspectives. *Journal of the American Psychoanalytic Association*, *58*, 741–778.
- Mahler, M. S., Pine, F., & Bergman, A. (1975). *The psychological birth of the human infant: Symbiosis and individuation*. New York: Basic Books.
- Meaney, M. J. (2010). Epigenetics and the biological definition of Gene x Environment interactions. *Child Development*, *81*, 41–79.
- O'Connor, T. G., Heron, J., Golding, J., Glover, V., & The ALSPAC Study Team. (2003). Maternal antenatal anxiety and behavioural/emotional problems in children: A test of a programming hypothesis. *Journal of Child Psychology and Psychiatry*, *44*, 1025–1036.
- Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology and the childhood roots of health disparities: Building a new framework. *Journal of the American Medical Association*, *301*, 2252–2259.
- Sorce, J. F., & Emde, R. N. (1981). Mother's presence is not enough: The effect of emotional availability on infant exploration. *Developmental Psychology*, *17*, 737–745.
- Sorce, J. F., & Emde, R. N. (1982). The meaning of infant emotional expressions: Regularities in caregiving responses in normal and Down's syndrome infants. *Journal of Child Psychology and Psychiatry*, *23*, 145–158.
- Strathearn, L., Fonagy, P., Amico, J., & Montague, P. R. (2009). *Adult attachment predicts maternal brain and oxytocin response to infant cues*. *Neuropsychopharmacology*, *34*, 2655–2666.
- Swain, J. E., Lorberbaum, J. P., Kose, S., & Strathearn, L. (2007). Brain basis of early parent–infant interactions: Psychology, physiology, and in vivo functional neuroimaging studies. *Journal of Child Psychology and Psychiatry*, *48*, 262–287.
- Taylor, S. E., Saphire-Bernstein, & Seeman, T. E. (2010). Are plasma oxytocin in women and plasma vasopressin in men biomarkers of distressed pair-bond relationships? *Psychological Science*, *21*, 3–7.
- Timmer, S. G., Thompson, D., Culver, M. A., Urquiza, A. J., & Alenhofen, S. (2012). Mother's physical abusiveness in a context of violence: Effects on the mother–child relationship. *Development and Psychopathology*, *24*, 79–92.
- van den Dries, L., Juffer, F., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Alink, L. R. A. (2012). Infants' responsiveness, attachment, and indiscriminate friendliness after international adoption from institutions or foster care in China: Application of emotional availability scales to adoptive families. *Development and Psychopathology*, *24*, 49–64.
- Wennberg, J. E. (2010). *Tracking medicine: A researcher's quest to understand health care*. New York: Oxford University Press.
- Yang, Y., Raine, A., Narr, F. L., Colletti, P., & Toga, A. W. (2009). Localization of deformations within the amygdala in individuals with psychopathy. *Archives of General Psychiatry*, *66*, 986–994.
- Zahn-Waxler, C., Robinson, J., & Emde, R. N. (1992). The development of empathy in twins. *Developmental Psychology*, *28*, 1038–1047.