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Of the Way We Are: On Temperament, Attachment, and the Transmission Gap: A Rejoinder to Fox (1995)

Marinus H. van IJzendoorn
Leiden University

ABSTRACT

In this rejoinder to Fox (1995) , it is argued that the development of attachment is environmentally labile during the first 5 years of life and that it remains sensitive to environmental changes during childhood and adolescence. The Adult Attachment Interview does not assess "the way we were" but measures an adult's current mental representation of (past and present) attachment experiences and relationships, particularly with his or her parents. Nevertheless, it has been empirically shown that, under certain conditions, attachment patterns remain stable or at least predictable, even across the first 18 years of life. Parents' sensitive responsiveness cannot fully explain the strong correspondence between parental attachment and infant attachment (the transmission gap). It is still unclear whether temperament contributes to bridging the transmission gap because a relation between adult temperament and adult attachment appears to be absent.

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Correspondence may be addressed to Marinus H. van IJzendoorn, Center for Child and Family Studies, Leiden University, Leiden, The Netherlands, NL-2300 RB.
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In many ways, Fox's (1995) opening anecdote of Egeland's intervention study is a telling story. This intervention in high-risk families was meant to change the insecurity and insensitivity of the mothers to their infants' attachment behavior, and it was therefore expected to increase the number of securely attached infants. The long-term and broadband intervention focused on supporting the parents in the hassles of daily life, providing them with behavioral feedback, and discussing the mothers' own developmental history. The intervention appeared to be unsuccessful in changing the infants' insecurity (Egeland & Erickson, 1993).
Fox (1995) does not mention, however, that the Egeland study is one of 16 intervention studies that have, so far, been reported in the attachment literature. Recently, van IJzendoorn, Juffer, and Duyvesteyn (1995) have taken stock of the available evidence, and the results of their meta-analysis show that experimental intervention studies are indeed effective in changing parental insensitivity (effect size [*d*] = 0.58), as well as in changing children's attachment insecurity (*d*

= 0.17; *N* = 869) in the expected direction. Longer, more intensive, and therapeutic interventions appeared to be less effective than short-term behaviorally oriented interventions. In fact, the combined effect size for the set of short-term, behaviorally oriented experimental intervention studies on attachment insecurity was considerable (0.48). This combined outcome of experimental attachment studies shows that sensitive responsiveness is definitely an important causal factor in attachment development.

The Adult Attachment Interview Is Valid

Fox (1995) readily acknowledges the predictive validity of the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985). In his reply to my article on the predictive validity of this instrument, he agrees in several places that the outcome of the interview with parents (even if completed prenatally) is reliably associated with the infant's attachment as observed in the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978). The empirical evidence is indeed overwhelming. In 18 samples (*N* = 854), I found a combined effect size of 1.06. This surprisingly large effect size is equivalent to a biserial correlation of .59 (Cohen, 1988). Furthermore, although the AAI was constructed only a decade ago (Main, Kaplan, & Cassidy, 1985), it is a cross-culturally replicated fact that the interview is stable over time, independent of interviewer effects or response bias, and unrelated to IQ, general discourse style, autobiographical memory, and general personality measures (Bakermans-Kranenburg & van IJzendoorn, 1993 ; Sagi et al., 1994 ; Waters et al., 1993). Its psychometric characteristics are therefore excellent.

The AAI radically breaks with the traditional clinical and retrospective studies on the influence of childhood experiences on adult functioning. It assesses adults' current mental representations of attachment on the basis of their discourse concerning past and present attachment experiences, particularly with their parents. In the AAI coding system, the content of adults' autobiographical story is irrelevant; the classification of the transcribed interviews depends on the form in which the story has been told, particularly the degree of coherence in a linguistic sense (Main & Goldwyn, 1993). It is difficult to grasp the meaning of this revolutionary shift from content to form of the autobiographical discourse. One remains tempted to ask how early childhood experiences affect the AAI classifications.

On the instrumental level, the answer is simple: Participants may report similar childhood attachment experiences and at the same time be classified in completely different AAI categories because their coherence of discourse differs; conversely, they may report strongly diverging experiences from their early years and nevertheless be classified in the same AAI category because their coherence of discourse is similar (Pearson, Cohn, Cowan, & Cowan, 1994). Neither the AAI classifications nor the coherence of discourse can, therefore, be considered a linear function of early attachment status only (contrary to Fox, 1995). When coding the AAI, one does not assume that the participants' self-reports of their childhood attachment experiences reflect any objective reality. There is no "early years determinism" or critical period thinking involved in the AAI classifications.

On the theoretical level, one may, of course, want to go beyond the issue of the AAI's reliability and validity and ask two fundamental questions: Which factors bring about the current adult attachment representations as assessed through the AAI? And which mechanisms are responsible for the strong influence of parents' attachment representations on infant attachment? Concerning the first issue, Fox (1995) suggests that early childhood attachment experiences per se may not be very influential in shaping one's current state of mind with respect to attachment. He claims

that temperamental differences and other personality characteristics may be more important in determining adults' perception of early experiences. Concerning the second issue, Fox (1995) speculates that parental sensitivity may not be an important mechanism through which parental attachment representations are being "transmitted" to children. He offers temperament as an alternative hypothesis to bridge the gap between the representations of the parents and the attachments of their children.

The Critical Period Idea Is a Misconception

Concerning the just-mentioned first issue, which would imply unconditional stability of attachment from childhood to adulthood, I have already emphasized that, in coding of the AAI, participants' self-reports about their early years are not taken for granted. On the contrary, the form of the discourse about (past and present) attachment experiences is decisive for the classification rather than the content of their autobiographies. Nevertheless, early attachment experiences may play a role empirically in the formation of adult attachment representations. No contemporary student of attachment theory, however, would argue that the current state of mind with respect to attachment is solely based on "critical experiences that occurred in the 1st year of life" (Fox, 1995, p. 407).

More than two decades ago, Bowlby (1973) wrote about the traditional model of life-span personality development as resembling a railway system with a single main line along which is set a series of stations. Personality development was supposed to be fixed from the very beginning, and only temporary stops, regressions, or accelerations were allowed to exist. In contrast, Bowlby compared his alternative model to a railway system that starts with a single main route to a certain direction but soon forks into a range of distinct routes, some of which diverge from the main route and others of which take a convergent course. At any point, critical junctions may show up at which the lines fork; once a train is on any particular line, homeorhesis (Waddington, 1957) tends to keep it on that line.

The development of attachment is not considered to be fixed during the 1st year of life, as Fox (1995) suggests, but should be regarded as "environmentally labile," particularly in the early years of life (Bowlby, 1973, p. 414). More specifically, Bowlby (1973, p. 236) has always contended that attachment is environmentally labile during the first 5 years and that, even during the decade after the 5th birthday, the development of attachment is sensitive to environmental changes, albeit in steadily diminishing degrees. At any stage during the years of immaturity–infancy, childhood, and adolescence–changes in child-rearing arrangements and life events such as rejections, separations, and losses (Egeland & Farber, 1984), but also positive experiences such as parents getting a job and adolescents finding a supportive partner (Rutter, Quinton, & Hill, 1990) or being in therapy (Bowlby, 1988), may provoke a change in the course of attachment development. In fact, Sroufe (1988) classified the critical period idea under the heading of "major misconceptions." Almost two decades ago, Sroufe (1978) wrote about his expectations for the longitudinal studies on which he was embarking:

> We would not expect a child to be permanently scarred by early experiences or permanently protected from environmental assaults. Early experience cannot be more important than later experience, and life in a changing environment should alter the qualities of a child's adaptation. (p. 50)

In view of the unequivocal counterevidence, the persistence of the critical period argument is remarkable. This persistence may be caused by the confusion of two levels of analysis: the

species-specific or evolutionary level and the individual differences or psychological level. At the first level, it has been argued that human beings are born with an "innate bias" (Bowlby, 1973) to become attached and that the first attachments develop in the 1st year of life. At the second level, the development of individual differences in quality or type of attachments is described as environmentally labile during a large part of the life span. Experimental studies on attachment (van IJzendoorn et al., 1995) specify some of the boundary conditions within which changes from insecure to secure attachments take place, whereas quasi-experimental (Aviezer, van IJzendoorn, Sagi, & Schuengel, 1994) and longitudinal (e.g., Vaughn, Egeland, Waters, & Sroufe, 1979) studies do the same for changes from secure to insecure attachments. For example, Sroufe, Egeland, and Kreutzer (1990) showed that secure attachments in the early years may not protect a child from deteriorating life circumstances during the preschool period. Nevertheless, they found some evidence that children with early internal working models of sensitive care and secure attachments are more responsive to positive changes of the environment and more resilient to stress during the elementary school years and that they may recover more easily from adversities than children who have been insecure from the very beginning (Sroufe et al., 1990).

Does Lawful (Dis) continuity of Attachment From Infancy to Adulthood Exist?

Is it the case that early childhood experiences do not shape or influence attachment representations in (young) adulthood in any way? Considering the "crucial experiment" of measuring infants' attachment classification at 1 year of age and then measuring their adult attachment status some 15 or 20 years later, as Fox (1995) suggests, I would indeed not expect a linear, bivariate association between infant and adult attachment under all conditions. First, because the sample would be only moderately large and about half of the participants would be insecure, correspondence by chance would already amount to some 50%. In a longitudinal study across two decades, it would be difficult to enhance this baseline significantly. Second, I would expect several participants to have experienced negative or positive life events and negative or positive changes in their child-rearing circumstances and to show a developmental trajectory of lawful discontinuity (Belsky & Cassidy, in press ; Sroufe, 1978). For example, participants who were insecurely attached to their single mother at the age of 1 may have "earned" a secure adult attachment status (Main & Goldwyn, 1993) after they married a supportive partner (Rutter, Quinton, & Hill, 1990). Pearson et al. (1994) reported that 20 of their 30 secure participants could be considered "earned secure." Only a statistical model that takes into account interactions between environmental changes, as well as initial and subsequent attachment status, may be expected to show significant multivariate associations. One may also have to apply a dynamic systems model to describe developmental pathways that are determined in a nonlinear way (Van Geert, 1991).

To my knowledge, two longitudinal studies on the (dis) continuity of attachment from infancy to adolescence or young adulthood have just been reported thus far. The Bielefeld longitudinal study illustrates the idea of lawful discontinuity. Fortynine families from Bielefeld, Germany, participated in a study starting with home observations of parental sensitivity during the 1st year of life. Between 12 and 18 months, the infants were observed with their parents in the Strange Situation to assess the quality of their attachment relationship (Grossmann, Grossmann, Huber, & Wartner, 1981). When the children were 6 years of age, AAI data of the parents were

collected. At 10 years of age, the children were interviewed to assess their mental representation of parental support. At 16 years of age, AAI data of 44 adolescents who were seen as babies became available. Life events such as divorce, life-threatening illness of the parents, and loss through death of parents or family members were assessed. Zimmermann (1994) demonstrated that the bivariate correspondence between attachment security in infancy and security of attachment representation in adolescence is insignificant. In particular, divorce and life-threatening illness of parents appeared to be associated with insecure adolescent attachment representations. In a multivariate hierarchical regression analysis, almost 70% of the variance of adolescent attachment security (as measured by Kobak's, 1993 , Q-sort coding of the AAI) could be explained by life events, maternal attachment representations, and children's representation of parental support (Zimmermann, 1994).

The idea of continuity is nicely illustrated in Hamilton's (1994) study of 30 adolescents who, as 1-year-olds, were observed in the Strange Situation. Hamilton (1994) found a remarkable stability of attachment across a 17-year period: 77% of her participants were similarly classified as secure or insecure at 1 year of age and at 17.5 years of age, when they completed the AAI, χ^2 1, $N = 30 = 7.65$, exact Fisher $p = .012$. Attachment classifications in adolescence were based on the thoroughly validated Main and Goldwyn (1993) coding system. The participants were recruited from a larger Californian sample in which children from families with alternative life-styles were overrepresented. Review of case notes for each family, gathered over the full course of the study, suggested that continuity of attachment was associated with stable negative or stable positive family circumstances. Adolescents who retained a secure attachment classification grew up in families that experienced few stressful circumstances. In contrast, adolescents who were classified as insecure at both assessments came from families characterized by marital dissolution, family violence, persistent parental substance abuse, or financial stress (Hamilton, 1994). This outcome suggests that the early years may leave their mark on later attachment representations if circumstances remain stable. In this respect, early attachment experiences may be important but not deterministic. More longitudinal projects across a similar age period are in progress to further elucidate the issue of lawful (dis) continuity of attachment. For example, Everett Waters and his coworkers presented data on their 20-year longitudinal study of attachment in 50 participants, who were observed in the Strange Situation at 12—18 months of age and who were interviewed using the Adult Attachment Interview. Stability of attachment was 70%. Instability was strongly related to major negative life events such as parental loss, abuse, or serious illness (Waters, Merrick, Albersheim, & Treboux, 1995).

The Role of Temperament Is Speculative

If the 1st year of life is not the only causal factor in the formation of adult attachment representations, is it possible that temperament plays an important role? Fox (1995) raised this second issue to help bridge the transmission gap. In my article (van IJzendoorn, 1995), I referred to this possibility by pointing out that temperamental characteristics of children have been assumed to explain at least part of the variation in their attachment behavior. At the same time, I cited evidence for some form of genetic transmission of basic temperamental characteristics. To test the temperament hypothesis, Fox (1995) proposes including questionnaire assessments of adult temperament characteristics such as affectivity and reactivity in future AAI studies.

Fortuitously, De Haas, Bakermans-Kranenburg, and van IJzendoorn (1994) have just finished exactly this type of study. Eighty-three Dutch mothers participated in the AAI and completed a

questionnaire designed to assess the temperamental dimensions of emotionality, activity, and sociability (Buss & Plomin, 1984). Significant associations between AAI classifications and temperamental characteristics were, however, absent (De Haas et al., 1994). Although this outcome is not very promising, one should not conclude that temperament does not affect parental attachment representations. As Rothbart (1989) noted, stability correlations of temperament measures are "in the .3—.4 range of magnitude" and thus "of a *very* modest size" (p. 109). Furthermore, the construction of questionnaires to assess the major personality dimensions (e.g., the so-called Big Five) has not always been rational, and there is much confusion as to what these questionnaires measure (Block, 1995). More conclusive evidence for the genetic transmission of attachment across generations may come from behavioral genetics studies using the AAI in adoption or twin designs (M. Main, personal communication, July 15, 1994).

What evidence is there for the association between temperament and attachment in infancy? In this respect, Fox (1995) cites his meta-analysis on the concordance between infant—mother and infant—father attachment classifications and argues that, because both attachment relationships show some overlap, temperamental commonalities may explain this concordance. This may well be the case. However, I would like to draw attention to an alternative explanation. In five studies, both partners in 226 couples were interviewed with the AAI. Aggregating the findings from these studies, van IJzendoorn and Bakermans-Kranenburg (in press) found that secure women and secure men marry each other more often than chance would indicate, and the same holds true for insecure women and insecure men. The association (r) amounted to .28. The concordance between infant—mother and infant—father attachment classifications ($\kappa = .31$; Fox, Kimmerly, & Schafer, 1991) may therefore be explained on the basis of the concordance between maternal and paternal attachment representations. In contrast to the four other studies on couples, the Steele, Steele, and Fonagy (1993) study that Fox (1995) cites did not show any association between maternal and paternal representations. This may explain why, in their study, a weak relation between infant—mother and infant—father attachment existed, even after the (nonexisting) overlap between maternal and paternal representations had been controlled. In this sample, modeling of parenting behavior may have caused the correspondence.

A more fruitful approach to the temperament hypothesis is, of course, the direct assessment of temperamental characteristics of infants observed in the Strange Situation procedure or similar attachment measures. Several studies have been carried out, but the results seem to be equivocal (Belsky & Cassidy, in press). Because the associations between temperament, on the one hand, and adult and infant attachment, on the other hand, are unclear, one can for the time being only speculate about the role of temperament in bridging the transmission gap. The role of parental sensitivity in bridging the transmission gap, however, has been empirically documented. First, in one of my meta-analyses, I described the association between parental attachment representations and parents' sensitive behavior; because the 1st year of life is not sacrosanct, studies examining parental sensitivity with infants as well as with toddlers and preschoolers were included (van IJzendoorn, 1995). Sensitivity measures for parents of toddlers and preschoolers have been widely used and found to be valid (Belsky & Cassidy, in press), in contrast to some measures of preschool attachment (Fox, 1995). Second, the causal role of parental sensitivity in the development of infants' attachment has been confirmed in meta-analyses of correlational studies (Goldsmith & Alansky, 1987) and, especially, experimental studies (van IJzendoorn et al., 1995). Parental attachment representations become expressed in parenting behavior (i.e., sensitive responsiveness), which in turn influences the quality of the infant—parent attachment

relationship. The problem of the transmission gap (the gap between parents' attachment representation and their infants' attachment) is therefore partly solved.

Conclusions

Along with Fox (1995) , I conclude (a) that adult attachment representations and infants' attachments are strongly related; (b) that there is not, as yet, a complete understanding of the connecting mechanism; and (c) that future studies should be directed at bridging the transmission gap more completely. Contrary to Fox (1995) , I have demonstrated that attachment theory has never assumed a critical period in the development of attachment but considers attachment to be environmentally labile during childhood and adolescence and that the AAI never was intended to assess "the way we were" in childhood; it measures one's current representation of past and present attachment relationships but is nevertheless *empirically* related to attachment experiences in childhood. Finally, I have argued that the role of temperament in bridging the transmission gap is still based on intriguing speculations instead of on sound empirical evidence.

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