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Published version:

DOI:10.1080/14616734.2021.1918454

Growing Points in Attachment Disorganization: Looking Back to Advance Forward

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Manuscript in press at *Attachment & Human Development*

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Abstract

In this special issue paper we reflect on the next generation of attachment research with a focus on disorganization, a central but still poorly understood topic in this area. We suggest that progress will be facilitated by a return to attachment theory's evolutionary roots, and to the emphasis on biological function that inspired Bowlby's original thinking. Increased interdisciplinary cross-fertilization and collaborations would enable novel and generative research on some of the long-standing questions surrounding attachment disorganization. Accordingly, we present an agenda for future research that encompasses contributions of modern ethology and neurobiology, novel hypotheses based on the concept of adaptive decanalization, connections with neurodevelopmental vulnerability and risk for mental disorders such as schizophrenia, and the possibility of sex differences in the behavioral manifestations of attachment disorganization. We believe that these avenues of theory and research offer exciting potential for innovative work in attachment disorganization in the years ahead.

Keywords: Bowlby, disorganized attachment, canalization, ethology, evolution, neurodevelopmental disorders, psychosis

As so artfully chronicled in *Cornerstones of Attachment Research* (Duschinsky, 2020), the first two generations of attachment researchers have provided an exceptionally generative body of research and scholarship. In the spirit of foundational "Growing Points" monographs (Bretherton & Waters, 1985; Waters et al., 1995) that took stock of attachment theory and method while looking ahead, here we offer our answer to Duschinsky's question concerning what genre of story the third generation of attachment scholars finds themselves in. In our view, the field is ready for a gripping tale of mystery, one in which emerging perspectives will raise new (and old) questions and prompt a new phase of theoretical exploration. One of the most pressing tasks we envision is the long overdue reintegration with evolutionary biology and psychology, in line with Bowlby's original thinking regarding attachment's fundamental role in survival, and—ultimately—in the promotion of biological fitness (Bowlby, 1969; Main, 1979; see Simpson & Belsky, 2016).

Over time, the evolutionary foundations of Bowlby's theory and the ethological observational approach to the identification infant attachment patterns (e.g., Ainsworth et al., 1978; Main & Solomon, 1990) have faded from mainstream attachment scholarship. As Chisholm (1996) remarked more than twenty years ago, attachment research has strayed from its "early safe haven in evolutionary theory;" as a result, our functional understanding of the basic patterns of attachment has remained limited. This is especially true of atypical and disorganized/disoriented patterns (i.e., "D"; Main & Solomon, 1990), despite their likely evolutionary importance as correlates of atypical parental behaviors and elevated environmental risk. Surprisingly, evolutionary analyses of individual differences in attachment have focused almost exclusively on Ainsworth et al.'s (1978) original organized attachment patterns (i.e., avoidant [A], secure [B], and resistant [C]), and the conceptually related dimensions of anxiety and avoidance (Belsky et al., 1991; Chisholm, 1996; Del Giudice, 2009; Szepsenwol & Simpson, 2019). Disorganization has remained virtually unexplored by evolutionarily-minded scholars, except as a dysfunctional outcome of conflicts between attachment and other motivational systems (Liotti, 2016).

Developmental research on disorganized attachment also remains saddled with theoretical gaps and unanswered questions, despite the remarkable amount of work carried out in the last three decades (Duschinsky, 2020). The idea that the disorganized classification may contain multiple subtypes with potentially distinct etiologies and functional underpinnings was briefly considered in the early years (Carlson et al., 1989a; Crittenden, 1999; Main & Solomon, 1990) of disorganization research, in particular by Lyons-Ruth and colleagues (Lyons-Ruth, Connell, & Zoll, 1989; Lyons-Ruth et al., 1991; Lyons-Ruth et al., 1999). However, with the exception of Lyons-Ruth and colleagues who have continued to pursue this strand of work (e.g., David & Lyons-Ruth, 2005; Lyons-Ruth et al, 2013; Lyons-Ruth, et al., 2016), this issue has received relatively little empirical scrutiny since, even though a few recent studies (e.g., Padrón, Carlson, & Sroufe, 2014) indicate the existence of meaningful heterogeneity (Green & Goldwyn, 2002; Solomon et al., 2017). The incomplete state of current knowledge is further illustrated by the case of dissociation. The expectation of an association between infant disorganization and later dissociative symptoms is supported by both theory (Liotti, 1992; 2016) and some evidence (e.g., Carlson et al., 1998), with additional studies finding higher dissociation scores in adolescents and adults with unresolved states of mind (e.g., Schuengel et al., 1999; West et al., 2001); but findings from recent large-sample work failed to support the infant disorganization - dissociation link (Haltigan & Roisman, 2015), suggesting it should not be reified as a core claim of attachment theory.

Precisely because it is still puzzling in a number of ways, disorganization may prove an ideal bridge between mainstream and evolutionary scholars. On the one hand, a biological perspective can be an invaluable guide to generate new ideas and hypotheses on the nature of attachment disorganization. On the other hand, existing evolutionary models of attachment are clearly incomplete, and need to be extended and revised to integrate the phenomenology of disorganization. A crucial task for the third generation is to deepen the field's understanding of the *variability* in attachment behaviors—especially those observed in infants classified as disorganized —by returning to the study of their potential evolutionary logic, in the footsteps of Main (1979; 1990) and others (Crittenden & Ainsworth, 1989). In what follows, we articulate a research agenda that synthesizes some of Bowlby's ethological and evolutionary insights in the development of attachment theory with new ideas and findings from the biological sciences.

Ethological Perspectives on Disorganization

It is seldom fully appreciated that the development of a coding system for previously unclassifiable infants seen in the Strange Situation procedure (SSP; Ainsworth et al., 1978) was undertaken against the backdrop of not only Bowlby's early ethological thinking around conflicting behavioral systems (cf. Bowlby, 1969, pp. 224-228; Green & Goldwyn, 2002), but also a painstaking observational approach informed by biological ideas (cf. Main et al., 2011, p. 435; Main & Solomon, 1990, p. 39). Indeed, Main's original motivation for pursuing work on the anomalous behaviors she observed in her dissertation sample was due in large part to her interest in ethology, including observations of odd-appearing behavior of animals in situations of motivational conflict (Main et al., 2011).

Among the disorganized phenomena that have captured the attention of attachment researchers, the most clear-cut exemplars of ethologically relevant behaviors are freezing, stilling, and slowed movements. In nonhuman primates, stilling is often observed in ambiguous or threatening communicative contexts with conspecifics (Hinde, 1966). Evolutionary biologists describe freezing (or "attentive immobility") as a functional response characterized by the rapid simultaneous activation of the sympathetic and parasympathetic systems, which allows the individual to quickly suppress current activities (thus avoiding detection), monitor the source of danger with heightened attention, and prepare for fight or flight if necessary (Hagenaars et al., 2014; Roelofs, 2017). Similarly, stilling and freezing behaviors for some infants may play a functional protective role, affording them time to form a "best estimate" of the parent's current state and intentions, especially in high-risk contexts in which caregiver behavior is often highly ambiguous and/or potentially harmful (see Crittenden, 1999).

The biological understanding of freezing has made considerable progress since Main's initial observations. For example, there is evidence that freezing is inhibited by GABA and potentiated by cortisol (Hagenaars et al., 2014; Nijenhuis et al., 1998). Of particular interest, serotonergic projections in the brain suppress fight-flight behaviors while promoting freezing (Graeff, 2004; Paul et al., 2014; Roelofs, 2017); hence, frequent occurrences of freezing should be associated with elevated serotonergic activity. If supported, this hypothesis would point to novel connections between freezing in the SSP and later psychopathology. Intriguingly, a longitudinal study by Niermann et al. (2019) found that patterns of internalizing symptoms across adolescence were predicted by a long duration of freezing in infancy, but also by the *absence* of freezing (in response to a surprising stimulus). Regardless of how the serotonergic hypothesis stands up to empirical scrutiny, it highlights the idea supported by contemporary evidence that neurobiological mechanisms involved in freezing may suggest a functional basis for the existence of distinct subtypes within the D classification.

As a second example, consider an infant's hand-to-mouth gesture on reunion with the parent with a clearly confused or wary expression, which is considered a direct index of disorganization. A first interpretation of this behavior is that the infant may have learned to cover their mouth to stifle cries of distress in a rejecting or insensitive caregiving environment, so as to avoid further rejection and hence maximize safety and availability of the caregiver (Crittenden, 1999; Hesse & Main, 2000; Landa & Duschinsky, 2013). Alternatively, based on considerable evidence that, in humans as well as other primates, gestures are not only communication tools but also play multiple *cognitive* roles for the individual who produces them (Cartmill et al, 2012). For example, non-human primates have been observed performing non-functional gestures during complex problem-solving tasks; these gestures are thought to be an indication of the primate exploring different options before settling on a solution (Cartmill et al, 2012).

Analogously, seemingly out-of-context behaviors and incoherent action sequences in disorganized infants may indicate the rapid exploration of alternative responses when confronted with an unpredictable caregiver, adding cognitive depth to the behavioral focus of classic ethological accounts. Evidence that sequential and simultaneous blends of (contradictory) avoidant and resistant behaviors are observed more often in infants exposed to high levels of abuse and neglect (Crittenden, 1985; van IJzendoorn et al., 1999; Cyr et al., 2010; Green & Goldwyn, 2002; Cicchetti & Barnett, 1991) suggesting novel ways to analyze the sequencing and content of disorganized behaviors.

Disorganization as Adaptive Decanalization?

The functional underpinnings of disorganized behaviors may be further illuminated with the biological concepts of *canalization* and *phenotypic integration* (Armbruster et al., 2014; Debat & David, 2001; Murren, 2012; Pigliucci & Preston, 2004). The notion of canalization was originally introduced by Waddington (1942, 1957); Bowlby (1973) drew on Waddington's work to ground his theory in a sophisticated understanding of developmental biology. Decades later, research on plasticity and canalization has made tremendous progress (e.g., Debat & David, 2001; Hallgrimsson et al., 2019; Siegal & Bergman, 2002), and attachment scholars may once again benefit by exploring the many potential connections with this area of research.

Canalization is a ubiquitous feature of developmental processes: by buffering development against genetic and/or environmental perturbations, canalization mechanisms ensure that the organism's traits will demonstrate robustness and develop reliably. Consequently, canalized traits show constrained variation across genotypes and environments (see Figure 1A). Phenotypic integration occurs when distinct traits of an organism are not free to vary independently but show specific correlation patterns. Thus, integration can be understood as a multivariate analogue of canalization, as it constrains *independent* variation among linked traits. Canalization can be implemented by specialized mechanisms, or evolve as an emergent property of complex developmental systems, which involve extensive redundancy and multiple layers of regulation (Badyaev, 2005; Geiler-Samerotte et al., 2019; Hallgrimsson et al., 2019).

Canalization and integration are necessary to enable robust, adaptive trait expression. But they also carry important costs: they inevitably limit an organism's plasticity, reduce the range of potential responses to the environment, and suppress the expression of potentially adaptive genetic variation (e.g., novel mutations). Thus, canalization/integration processes can themselves evolve to show adaptive plasticity, and produce different patterns of variation and covariation in different kinds of environments (Pigliucci & Preston, 2004). As a rule, highly stressful conditions tend to reduce canalization and increase phenotypic variability (Debat & David 2001; Rowiński & Rogell, 2017). The literature on integration is less consistent, and different studies have found both stronger and weaker correlations under stress (e.g., Lea et al., 2019; Merrill & Grindstaff, 2018). A plausible interpretation of these findings is that mild challenges can be successfully addressed with the available responses, leading to reinforce existing correlations among traits ("more of the same"). In contrast, severe stress implies that an organism is experiencing extreme unpredictability and/or uncontrollability, and hence that the available responses are not functioning as intended (Del Giudice et al., 2018a). In such conditions, reduced integration allows the organism to explore novel solutions—including responses that would be too costly, counterproductive, or otherwise detrimental in a more benign environment (Badyaev, 2005). For simplicity, we use *decanalization* as a shorthand for the release of variation and loosening of trait correlations under severe stress (see Figure 1B). Adaptive decanalization can be viewed as a risky, last-resort adaptive strategy that pushes the envelope of the organism's response in an attempt to regain control over the environment. The concept of adaptive decanalization corrects the unwarranted but common assumption that a loss of canalization is necessarily maladaptive and/or pathological (e.g., Gibson, 2009).

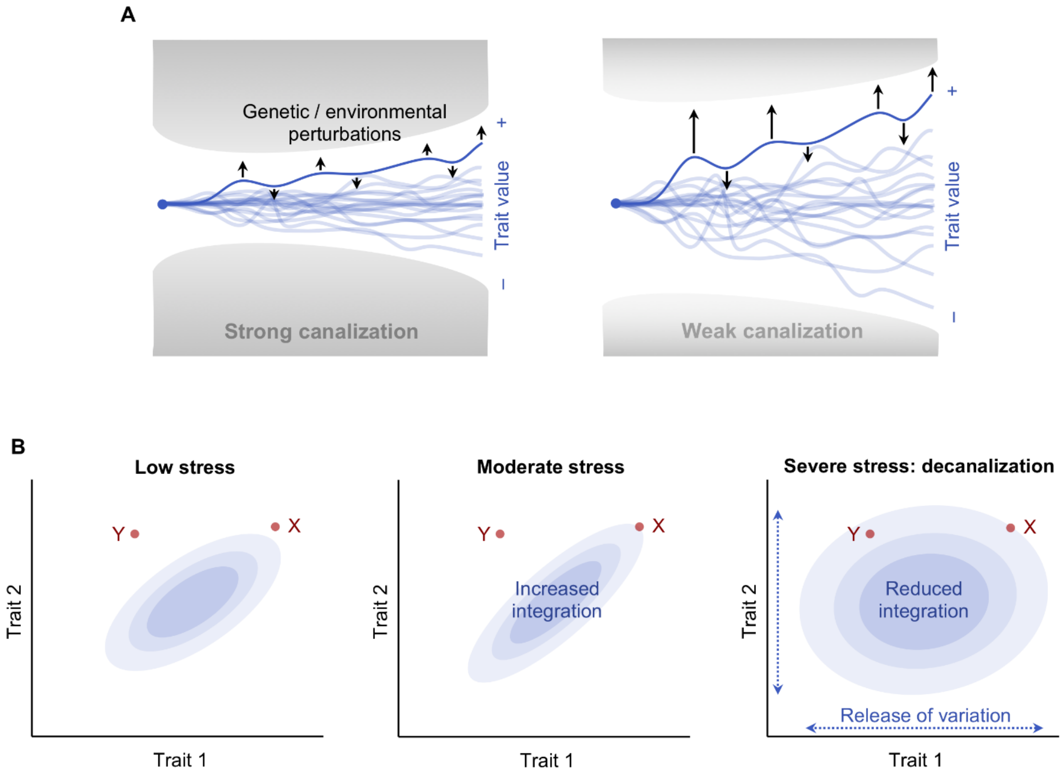

Figure 1. Schematic illustration of canalization and decanalization. (A) Strongly canalized traits (left panel) are buffered against genetic and environmental perturbations; as a result, they tend to develop within a narrow range and show restricted variation. Weakly canalized traits (right panel) show larger responses to environmental and genetic factors and tend to be more variable. Each line in the figure shows the developmental trajectory of an individual. Arrows represent genetic and developmental perturbations that tend to either increase (up) or decrease (down) the value of the trait. (B) Exposure to moderate stress during development tends to increase phenotypic integration (center panel). Stronger correlations among traits reinforce the organism's existing responses by promoting the cohesive phenotypic expression of specific patterns of traits (e.g., point X). In contrast, severe stress tends to release trait variation and reduce phenotypic integration (decanalization; right panel). Decanalization allows the organism to express novel, less constrained patterns of traits (e.g., point Y), which would normally be detrimental but may prove effective against the present threat.

The biology of decanalization offers a novel, intriguing perspective on the phenomenology of disorganized attachment—most notably the simultaneous or sequential juxtaposition of avoidant and resistant behaviors. In some instances of disorganization, seemingly contradictory behaviors are expressed together or in sequence, often accompanied by unusual or out-of-context responses. This is usually interpreted as a maladaptive breakdown of attachment strategies; the alternative possibility we propose is that these behavioral patterns may reflect adaptive decanalization, in response to extreme stress and unpredictability in the relationship with the caregiver. From this vantage point, it is noteworthy that mixed avoidant/resistant behaviors are especially common in maltreated infants and children (see above). When organized attachment behaviors systematically fail to reduce stress and prevent actual or perceived threats from the caregiver, decanalization may allow the child to "explore" alternative coping options and (hopefully) arrive upon behavioral combinations that reduce the heightened activation of the attachment system. It is worth restating that "risky" strategies such as decanalization can be biologically adaptive, despite their costs, if they are better than the alternatives *on average* (Frankenhuis & Del Giudice, 2012).

From a neurobiological standpoint, reduced serotonergic activity is a plausible candidate mechanism for behavioral decanalization. Serotonin promotes behavioral persistence and response inhibition, especially in response to threatening and aversive events (e.g., Cools et al., 2011; Moore & Depue, 2016; Moran et al., 2018). Reduced serotonergic tone should lower the sequential coherence of behavioral strategies, and—by releasing inhibitory constraints—should permit a broader range of responses in challenging situations (such as the SSP). Intriguingly, this could possibly explain why chronically undernourished infants show high and persistent levels of mixed avoidant/resistant behaviors (both sequentially and simultaneously), without other disorganization indices such as freezing, interruptions, and fear displays (Valenzuela, 1990; Waters & Valenzuela, 1999). Serotonin is synthesized from tryptophan, an essential amino acid that can only be obtained from the diet; hence, chronically undernourished infants are very likely to experience serotonin deficiency. The diet-related (i.e., food deprivation) suppression of serotonergic activity could potentially explain some variation in the anomalous frequency of mixed avoidance/resistance, even in absence of maltreatment or especially threatening caregivers. Moreover, serotonin deficiency could explain the surprising absence of freezing and stilling in undernourished D infants (Waters & Valenzuela, 1999).

The adaptive decanalization hypothesis is of course speculative, but it can facilitate new ways of thinking about specific kinds of disorganized behaviors. The concept of decanalization can be valuable even if the "adaptive" part of the hypothesis fails to be supported, or is relevant only to a subset of cases (e.g., behavioral decanalization in undernourished children). Intriguingly, the adaptive decanalization hypothesis complements Bowlby's original use of canalization to explain the development of organized attachment behaviors, while preserving the idea that both the organized and the later-identified non-organized patterns (Crittenden, 1985; Main & Solomon, 1986) arise from the action of functional evolved mechanisms.

Links with Neurodevelopmental Vulnerabilities

The phenotypic resemblance between some aspects of infant disorganization and behaviors typically found in neurodevelopmental disorders (e.g., freezing, stilling, atypical postures and behavioral stereotypies) was recognized early on by Main in her coding of samples of children diagnosed with autism (Capps et al., 1994; Rozga et al., 2018). While there are codified procedures to account for this overlap (e.g., Pipp-Siegel et al., 1999), in practice they are utilized only when examining samples with known neurodevelopmental disorders or risk for such disorders (e.g., autism spectrum disorders, ASDs; e.g., Haltigan et al., 2011).

This overlap may have broader implications for understanding the etiological and phenotypic aspects of infant disorganization. Specifically, it is likely that one or more unique subpopulations of disorganized infants exist which are characterized by trait vulnerability to various neurodevelopmental conditions (Barnett et al., 1999) or neurobehavioral atypicalities (e.g., Spangler, 2019; Spangler et al., 1996; Spangler et al., 2009; Padrón et al., 2014), including schizophrenia spectrum disorders (SSDs). There is considerable evidence that both SSDs and certain variants of ASDs (particularly low-functioning syndromes) are strongly influenced by early insults and deleterious mutations, including chromosomal abnormalities and rare/de novo copy number variants (CNVs; Keller, 2018; Ronemus et al., 2014).

Surprisingly, the links between attachment disorganization, dissociation, and risk for schizophrenia have remained virtually unexplored (although see: Liotti & Gumley, 2008), despite evidence of associations between unresolved adult attachment classifications and disorders on the psychosis spectrum (Dozier, 1990; MacBeth et al., 2011; Tyrrell & Dozier, 1999). Moreover, there is a high prevalence of unresolved classifications in borderline personality disorder (BPD; Macfie et al., 2014)—a condition with strong genetic overlap with psychosis and substantial comorbidity with disorders in the psychosis spectrum (Witt et al., 2017). For example, Macfie et al., (2014) found that mothers with BPD show higher scores on the preoccupied/unresolved dimension of the AAI, which predicted the frequency of children's narrative representations conceptually relevant to infant disorganization (e.g., incongruent child and self/fantasy confusion). These findings linking BPD or borderline personality features with early caregiving, infant disorganization, dissociation, and unresolved classifications on the AAI are consistent with prior work connecting these phenomena (e.g., Carlson, Egeland, & Sroufe, 2009; Khoury et al., 2019; Lyons-Ruth, 2008; Lyons-Ruth & Brumariu, 2020; Lyons-Ruth, Melnick, Patrick, & Hobson, 2007).

Taken together, this corpus of work suggests the possibility of a "schizotypal" class of disorganized infants with increased risk for later SSDs and other disorders on the psychosis spectrum (e.g., bipolar disorders); in dimensional models of psychiatric nosology, these disorders are subsumed under the psychosis and thought disorder spectra (see Kotov et al., 2017; Kotov et al., 2020). Despite its clinical distinctiveness, BPD is also genetically linked to the psychosis spectrum; thus, investigating the links between attachment and psychosis may illuminate previous research on borderline phenomena in unexpected ways.

From an evolutionary perspective, subthreshold schizotypal traits (e.g., magical thinking and perceptual distortions) can be viewed as "risky" phenotypes that may increase genetic fitness through enhanced mating success, but also lead to catastrophic dysfunctions (i.e., severe psychotic symptoms) in individuals who carry additional genetic or environmental vulnerabilities (Shaner et al., 2004; Del Giudice, 2017). Of note, the sexual selection model of schizophrenia is conceptually linked to the decanalization hypothesis we presented above: according to the model, schizotypal traits increase phenotypic variance by amplifying the positive/negative effects of multiple genetic and environmental factors. Decanalization has been repeatedly proposed as an important etiological process in SSDs and other neurodevelopmental disorders (e.g., Burrows & Hannan, 2013; McGrath et al., 2011), under the default assumption that decanalization is maladaptive. Both the sexual selection model of schizophrenia and our hypothesis on disorganization consider the possibility that decanalization may function as a risky, yet potentially beneficial strategy. Other evolutionary approaches have focused on the potential role of mismatches between ancestral and modern environments; an example is the unprecedented exposure to out-group members, which may be perceived as threatening, brought about by urbanization and mass migration (Abed & Abbas, 2011, 2014; Del Giudice, 2018). This perspective could suggest novel hypotheses about the epidemiology and demographics of disorganization.

Disorganization in Males and Females

Although prior meta-analytic work did not find evidence of sex differences in infant attachment disorganization (van IJzendoorn et al., 1999), the set of studies included in the meta-analysis was heterogeneous, and some studies of infant disorganization in high-risk samples have found evidence for increased rates of attachment disorganization in males (e.g., Carlson et al., 1989b; Lyons-Ruth et al., 1999). It is worth noting that these studies (most of which were included in van IJzendoorn et al.'s meta-analysis) only probed differences between male and female distributions at the level of attachment categories (Lyons-Ruth et al., 1999 the exception); it is not clear whether more robust differences would emerge if analyses were conducted using continuous disorganization scores. The pattern of sex differences becomes stronger and more consistent in the studies of attachment in early and middle childhood, using both separation-reunion procedures and doll-play vignettes (Barone et al., 2009; Del Giudice, 2008; Gloger-Tippelt et al., 2016; Solomon & George, 2011; Toth et al., 2013).

Of course, the relations between disorganized phenomena in infancy and middle childhood are complex, as is the empirical meaning of disorganization itself, and one must exercise care and diligence when drawing the necessary distinctions. That said, the totality of the data does point to the possibility that attachment disorganization may be more prevalent and/or expressed more intensely in boys, especially as children mature and sex differences in cognition and behavior become more pronounced. Middle childhood is a phase of rapid neurobehavioral maturation, driven by the onset of adrenal androgen secretion or *adrenarche*. Many sex differences in behavior—from aggression and social play to psychopathology—emerge or intensify during middle childhood (see Del Giudice, 2014); accordingly, there is good reason to suspect that disorganized phenomena may follow a similar trajectory.

The idea that disorganization may occur at different rates or with different characteristics in the two sexes is conceptually plausible for a number of reasons. First, males are at heightened risk for perinatal mortality and morbidity (Elsmén et al., 2004; Wells, 2000) and more vulnerable to most types of neurodevelopmental disorders (Polyak et al., 2015). Indeed, the Lyons-Ruth et al. (1997) study was consistent with this notion: infant disorganization was associated with lower mental developmental index (MDI) scores as measured by the Bayley Scales of Infant Development, and males were overexpressed within those disorganized infants whose MDI scores were below 100, albeit low cell sizes precluded formal significance testing of this three-way effect.

Secondly, males also tend to be phenotypically more variable (Del Giudice et al., 2018b; Wyman & Rowe, 2014) and less developmentally canalized. Sexual selection is generally stronger on males, and traits subject to sexual selection tend to become exaggerated, more variable, and more sensitive to an individual's condition (Del Giudice et al., 2018b; Geary, 2015, 2017). In addition, selection to preserve adult reproductive function in the face of environmental perturbation should lead to stronger developmental buffering in females (Stinson, 1985) and is consistent with the idea that early stress tends to affect males more severely than females (Wells, 2000; for some exceptions see Geary, 2017).

David and Lyons-Ruth (2005) discussed sex differences in disorganization drawing on the "tend and befriend" hypothesis (Taylor, 2006; Taylor et al., 2000). The core idea is that females often react to threats and stressors with affiliation, caregiving, and search for social support—a pattern markedly different from the male-biased "fight or flight" response. Specifically, David and Lyons-Ruth (2005) suggested that sex differences in disorganization may become apparent when considering variation within the disorganized classification based on the best-fitting secondary "organized" classification. They found that female infants were more likely to be classified as D/Secure and male infants D/Insecure; when the mother's behavior became more frightening, female infants continued to approach them consistent with the

D/Secure classification, whereas male infants evidenced displays of conflicted and disorganized behaviors characteristic of the D/Insecure classification (David & Lyons-Ruth, 2005).

Based on the decanalization hypothesis we proposed disorganized males should show high levels of behavioral inconsistency, such as mixed intense displays of avoidance and resistance. Also, to the extent that broader neurodevelopmental vulnerabilities (e.g., for ASDs and SSDs) are linked to specific types of disorganized behavior, such as stilling and atypical postures, there may be patterns of sex differences in the frequency and correlates of these behaviors. Autism is overwhelmingly more common in males (French et al., 2013), and males tend to develop more severe forms schizophrenia and other SSD, and are strongly overrepresented in childhood-onset SSDs (Bartlett, 2014). There are also indications that freezing responses to danger and trauma may be more strongly expressed in females (Hagenaars, 2016; Kalaf et al., 2015), suggesting another possible pathway for sex-differentiated patterns of behavior within the D category. Collectively, these strands of work suggest that sex-linked patterns of developmental plasticity and stress-response functioning may plausibly underlie different subtypes of infant disorganization that could be validated by examining associations with increased liability to specific psychopathology syndromes and mental disorders in adolescence and adulthood.

Conclusion

Bowlby (1960) noted that a main reason he valued ethology was because it provided a wide range of new concepts to “try out in our theorizing.” In sketching our vision for the third generation of attachment research through the lens of infant disorganization, we close by reemphasizing Bowlby’s original view and suggest that a good deal of value is to be found in the application of contemporary evolutionary-developmental psychology (Ellis & Bjorklund, 2005) to attachment scholarship, and specifically attachment disorganization; this is because within the current D classification system, varied behaviors might reflect one or more of a range of possible behavioral strategies, thus making the articulation of theoretically well-grounded explanatory hypotheses regarding their appearance and meaning challenging.

Advances in the current understanding of attachment disorganization would strengthen attachment theory, increase its theoretical richness, and help bridge the gap with biological approaches in psychology. The evolutionary ideas discussed here also have potential value for informing policy and applied practice (Ellis et al., 2011). For example, evolutionary-minded scholars have used related ideas to explore novel treatment approaches (e.g., Ellis et al., 2017). As Schuengel et al. (this issue) highlight, optimizing societal contributions of attachment research is a critical issue for the next generation of attachment researchers to embrace. We look forward to a vibrant third generation of attachment scholars who make new, unexpected discoveries, and write the next chapter in the story of attachment research.

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