CHAPTER 4

Development, Attachment, and Childhood Experiences

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Attachment theory (Bowlby 1969) describes how individuals manage their most intimate relationships with their "attachment figures": their parents, children, and romantic partners. Attachment, at an evolutionary level, is an adaptation for survival—it is the mechanism by which babies elicit essential care. As more is understood about the interface of brain development and early psychosocial experience, however, it becomes clear that the evolutionary role of the attachment relationship goes far beyond giving physical protection to the human infant.

Beginning at birth, the infant's interactions with his or her primary caregivers will form a characteristic pattern that will shape personality development and affect close relationships in later life, as well as expectations of social acceptance and attitudes toward rejection. When the attachment figure responds appropriately to an infant who is undergoing a stressful experience by providing stability and safety, the infant is reassured, confident, and able to explore the surroundings. Through the consistent experience of this reassuring interaction, the child is able to build mental models of self and of others (internal working models), which often endure across life. These early attachment interactions are central to the development of the child's ability to regulate affect and stress, to mentalize, and to acquire attentional control and a sense of self-agency (Fonagy et al. 2010).

Attachment has traditionally been measured through assessments of characteristic patterns of relating. The most influential protocol for observing individual differences in infants' attachment security has been the Strange Situation (Ainsworth et al. 1978), during which an infant is briefly separated from the caregiver and left with a stranger in an unfamiliar setting. Three distinct attachment patterns have been identified in infants' behavior: secure (63% of children tested), anxious/resistant or ambivalent (16%), and avoidant (21%). The attachment styles in adults are secure/autonomous (58% of the nonclinical population), avoidant/dismissing (23%), and anxious/preoccupied (19%) (Bakermans-Kranenburg and van IJzendoorn 2009). The Adult Attachment Interview (AAI; George et al. 1994; Hesse 2008), which is based on reported attachment narratives of the subject's childhood, is the measure used to classify adults. A fourth pattern has now been identified, labeled as unresolved/disorganized for adults and disoriented/disorganized for infants (Levy et al. 2011); unresolved/disorganized adults are additionally classified within one of the three primary categories (Fonagy et al. 2010).

During the Strange Situation procedure, a securely attached infant curiously investigates his or her new surroundings in the primary caregiver's presence, appears anxious in the stranger's presence, is distressed by the caregiver's brief absence, rapidly seeks contact with the caregiver when the caregiver returns, and is easily reassured enough to resume exploration and investigation. Analogously, an adult categorized as secure/autonomous during the AAI coherently integrates attachment memories into a meaningful narrative and shows an appreciation for attachment relationships.

An avoidant infant appears less anxious at separation, may not seek contact with the caregiver on his or her return, and may not seem to prefer the caregiver over the stranger. In adults, avoidant/dismissing AAI narratives will seem incoherent; these adults will struggle to recall specific memories in support of general arguments and will idealize or devalue their early relationships (Fonagy et al. 2010). These behaviors are the result of a hyperdeactivation of the attachment system. The individual will characteristically appear inhibited when it comes to seeking proximity, seem determined to manage stress alone, and tend to adopt noninterpersonal strategies for regulating negative emotions and handling moments of vulnerability.

An anxious/resistant infant shows less interest in exploration and play in the new environment, becomes highly distressed by the separation, and struggles to settle after being reunited with the caregiver. Correspondingly, an anxious/preoccupied adult's AAI narratives will also lack coherence and will express confusion, anger, or fear in relation to early attachment figures. This strategy, entailing the hyperactivation of proximity-seeking and protection-seeking behaviors, is an adaptation to hypersensitivity toward signs of possible rejection or abandonment and to an intensification of undesirable emotions during these moments.

A disoriented/disorganized infant will show undirected or bizarre behavior, such as freezing, hand clapping, or head banging, or may try to escape the situation. An unresolved/disorganized adult's AAI narratives about bereavements or childhood traumas will contain semantic and/or syntactic confusions. This corresponds to the breakdown of strategies to cope with stress, which leads to emotion dysregulation.

These styles generally persist into adulthood: the correlation in attachment classification between infancy and adulthood is 68%–75% (Fonagy et al. 2010). The factors most likely to disrupt or modify attachment style are negative early life events: loss of a parent, parental divorce, life-threatening illness of parent or child, parental psychiatric disorder, physical maltreatment, or sexual abuse.

The influence of genetic factors in attachment security has been estimated at between 23% and 45% (Brussoni et al. 2000; Torgersen et al. 2007) and underscores the bidirectional nature of the development of attachment relationships: infants and children co-create patterns of relating with their caregivers. Nevertheless, to the extent that these are separable, environmental factors ubiquitously appear to be the most important influence in the development of attachment. Among these external factors, the most important is the secure presence of an effective primary caretaker who is sensitive to the infant's verbal and nonverbal cues and is able to respond to them without being overwhelmed by anxiety.

The persistent quality of attachment styles produces similarly enduring strategies for dealing with emotions and social contact. For example, the increased sense of agency in the secure child allows him or her to move toward the ownership of inner experience and toward an understanding of self and others as intentional beings whose behavior is organized by mental states, thoughts, feelings, beliefs, and desires. Consistent with this, longitudinal research has demonstrated that children with a history of secure attachment are independently rated as more resilient, self-reliant, socially oriented (Sroufe 1983; Waters et al. 1979), and empathic to distress (Kestenbaum et al. 1989) and as having deeper relationships and higher self-esteem (Sroufe et al. 1990). Securely attached individuals trust their attachment figures and do not exaggerate environmental threat; as a result, they can respond proportionately to challenges (Nolte et al. 2011).

Avoidant/dismissing individuals may have a higher tolerance for experiencing negative emotions, whereas anxious/preoccupied individuals, who tend to be wary following a history of inconsistent support from caregivers, are likely to have a lower threshold for perceiving environmental threat and, therefore, stress. This is likely to contribute to frequent activation of the attachment system, with the concomitant distress and anger such activation can cause being likely to manifest as compulsive care-seeking and overdependency. Unresolved/disorganized individuals—the adult analog of disoriented/disorganized infants—frequently have parents who are themselves abusive or unresolved regarding their own losses or abuse experiences.

Evidence linking attachment in infancy with more general personality characteristics is stronger in some studies than in others. Findings from the Minnesota Longitudinal Study of Parents and Children cohort show a prediction from infantile attachment insecurity to performance on adult measures of psychiatric morbidity, with many potential confounding factors controlled for, linking insecurity and adversity to indications of personality disorder (Carlson et al. 2009). A "dose-response" relationship between psychological disturbance and insecurity is suggested by the observation of Kochanska and Kim (2013), who found that children who are insecure with both parents tend to report more overall problems and to be rated by teachers as having more externalizing problems than those who are secure with at least one parent. However, in

contrast to Bowlby's (1980) prediction, the avoidant and resistant classifications tend not to be strongly related to later measures of maladaptation. It is the disoriented/disorganized infant category that appears to have the strongest predictive significance for later psychological disturbance (Fearon et al. 2010), although there is also some evidence to suggest a connection between avoidance and internalizing conditions (depression and anxiety) (Groh et al. 2012).

Attachment processes are, then, a necessary and universal mechanism for survival and development; they do not, for example, show gender differences or variations with language or culture. Attachment theory is also, however, increasingly thought to have a bearing on the understanding and treatment of personality disorders (PDs). With its integration of psychological, psychiatric, genetic, developmental, neuroscientific, and clinical perspectives, the theory is uniquely well placed to inform and develop our thinking about PDs, in all their enduring and pervasive complexity.

Attachment History and the Development of Personality Disorder

The characteristics, behaviors, and symptoms associated with insecurely attached adults are often also manifested by individuals with a PD (Adshead and Sarkar 2012). Studies of attachment patterns in people with PDs, particularly those in DSM-IV Cluster B (Bender et al. 2001), indicate that such individuals show higher rates of insecure attachment than the general population (Cassidy and Shaver 2008). Conversely, those diagnosed with borderline PD (BPD) and avoidant PD rarely fall into the secure attachment category (Westen et al. 2006). Adults presenting a preoccupied style are more sensitive to rejection and anxiety and are prone to histrionic, avoidant, borderline, and dependent PDs. The hypoactivation of attachment shown by individuals with a dismissing style explains the association with schizoid, narcissistic, antisocial, and paranoid PDs.

A high prevalence of childhood trauma occurs in both insecurely attached individuals and patients with PD. Childhood trauma is strongly correlated with an incoherent/disorganized adult attachment style more than just with the general category of attachment insecurity (Barone 2003; Westen et al. 2006). Rates of childhood trauma among individuals with PDs are high (73% report abuse, of which 34% is sexual abuse, and 82% report neglect). Compared with healthy adults, patients with PD are four times as likely to have suffered early trauma (Johnson et al. 1999). Childhood physical abuse increases the risk for adult antisocial, borderline, dependent, depressive, passive-aggressive, and schizoid PDs (McGauley et al. 2011). Infantile neglect is associated with risks for antisocial, avoidant, borderline, narcissistic, and passive-aggressive PDs (Battle et al. 2004; Johnson et al. 1999). BPD is more consistently associated with childhood abuse and neglect than are other PD diagnoses. Obsessive-compulsive PD has been associated with sexual abuse by noncaretakers (Battle et al. 2004).

However, not all people who have suffered childhood trauma develop adult psychopathology. The effects of trauma are influenced by attachment and by biological dispositions. For example, female victims of maltreatment and sexual abuse in adolescence or adulthood are at greater risk of developing posttraumatic symptoms if they have an anxious attachment style (Sandberg et al. 2010), and female

victims of childhood trauma are more likely to develop somatization symptoms if they are fearfully attached (Waldinger et al. 2006). If traumatic events provoke activation of the attachment system, then individuals who tend to respond to these experiences by the inhibition of mentalizing function and emotional regulation are less likely to resolve these events and more likely to manifest personality pathology later in life (Bateman and Fonagy 2012).

BPD is strongly associated with preoccupied attachment in the presence of unresolved trauma and with unresolved attachment patterns. Studies have found that 50%–80% of patients with BPD fit either or both of those two attachment styles (Agrawal et al. 2004; Barone et al. 2011); this makes sense in light of both the approach-avoidance social dynamics and sensitivity to rejection (preoccupied dimension) and the cognitive-linguistic slippage (incoherent/disorganized dimension) that are evident in patients with BPD. Misunderstanding of social causality and thought disturbances are distinctive features of BPD. In behavioral terms, patients with BPD exhibit angry withdrawal and compulsive care seeking. This implies their lack of capacity to use and obtain relief from new attachment figures, which has important implications within a close helping relationship like the therapeutic exchange: patients with BPD will be more attentive to the failures or perceived failures of the therapist than to the therapist's efforts to help (Aaronson et al. 2006).

Most research assessing the relationship between attachment and PDs does not control for comorbidity on either Axis I or Axis II of DSM-IV, which could result in diffuse patterns of association (Barone et al. 2011; Westen et al. 2006). For example, in the case of BPD, different symptom disorder comorbidities are associated with different attachment styles: BPD with comorbid anxiety or mood disorders tends to be associated with preoccupied attachment, whereas BPD with comorbid substance or alcohol abuse tends toward a dismissing style. In spite of these differences, the unresolved/disorganized attachment style seems to be common in patients with BPD overall, which explains the pathognomonic emotional dysregulation of these patients (Barone et al. 2011). These research limitations accentuate the value of the new efforts toward dimensional rather than categorical diagnostic systems (Cartwright-Hatton et al. 2011; Widiger et al. 2011) and toward person-centered rather than symptom-centered ways of addressing mental disorders. Such ways of understanding and conceptualizing psychopathology (and particularly PDs) are necessarily longitudinal because only a developmental perspective can offer an insight into the processes underlying symptomatic manifestations and allow clinicians to assess a particular patient's risks and strengths, account for high rates of comorbidity, tailor interventions, and maintain a fruitful therapeutic relationship. We review the alternative model for the classification of PDs that appears in DSM-5 Section III, "Emerging Measures and Models," later in this chapter (see section "An Attachment Theory of Borderline Personality Disorder Based on Mentalization").

Neuroscience of Attachment

The neurobiological processes at work in attachment are now fairly well understood. Two major neural systems have been shown to play a critical role in attachment behaviors: the dopaminergic re-

ward-processing system and the oxytocinergic system (Fonagy et al. 2011). The role of the dopaminergic reward system in attachment behavior is understood as an evolutionary mechanism to motivate reproductive mating, maternal care, and ultimately, offspring survival. This reward system leads individuals to seek close relations with other humans and produces satisfaction when they are attained. Oxytocin is a neuroactive hormone produced in the hypothalamus and projected to brain areas that are associated with emotions and social behaviors. It plays an important role in the activation of the dopaminergic reward system (oxytocin receptors are located in the ventral striatum, a key dopaminergic area) and in the deactivation of neurobehavioral systems related to social avoidance (Fonagy et al. 2011; see also Chapter 23, "Translational Research in Borderline Personality Disorder," in this volume). Oxytocin receptors are found in areas known to be recruited in attachment and other social behaviors, such as the bed nucleus of the stria terminalis, the hypothalamic paraventricular nucleus, the central nucleus of the amygdala, the ventral tegmental area, and the lateral septum. Oxytocin promotes dopamine pathways to and from the emotional brain (amygdala/thalamus), memory brain (hippocampus), and executive brain (frontal lobes).

"Knockout" laboratory animals with a genetic mutation rendering them devoid of oxytocin do not develop normally in terms of sociability and caregiving. Oxytocin helps promote social behavior; for example, monkeys without oxytocin do not read social cues as well as those with oxytocin, and they fall to the bottom of the troop status hierarchy. Oxytocin also promotes the "caregiver's bond." Female rats without oxytocin mother poorly, and this has downstream effects on their female offspring, which themselves grow to have limited competence in maternal behavior. Oxytocin is a facilitator of attachment: it enhances sensitivity to social cues, accelerates social connectedness (Bartz and Hollander 2006), improves social memory, and facilitates the encoding and retrieval of happy social memories. By attenuating activity in the extended amygdala, oxytocin also acts to neutralize negative feelings toward others and enhance trust. Oxytocin can inhibit hypothalamic-pituitary-adrenal (HPA) axis activity when the attachment system is activated (Fonagy et al. 2011): secure attachment leads to "adaptive hypoactivity" of the HPA axis, which, in turn, reduces social anxiety (Nolte et al. 2011).

It must be noted that these positive effects of oxytocin are not universal. The administration of oxytocin to adults has been shown to facilitate prosocial behavior toward members of their in-group only and to enhance trust toward reliable and neutral peers but not peers who have proven to be unreliable (De Dreu et al. 2010; Mikolajczak et al. 2010). Correspondingly, insecure attachment is closely bound to the divergent effects of oxytocin. The neuropeptide is found in lower concentrations among maltreated children and adults with a history of early separation and in insecurely attached mothers during the puerperal period, which further hampers the establishment of secure attachment in their children (Fonagy et al. 2011). In the case of insecurely attached patients with BPD, oxytocin *decreases* trust and the likelihood of cooperative responses, but it reduces dysphoric responses to social stress (Simeon et al. 2011).

Oxytocin, therefore, does not uniformly facilitate trust and prosocial behavior; its behavioral effects are mediated by the social context, personality traits, and the quality of early attachment

(Simeon et al. 2011). These interactions highlight the need to address mental health in general as an indivisible combination of environmental, psychological, and physical factors. For example, early maltreatment is more likely to produce adult antisocial behavior only in males with a polymorphism in the gene involved in the production of the neurotransmitter-metabolizing enzyme monoamine oxidase A (MAO A). Males with high MAO A activity show less antisocial behavior even if they have experienced early maltreatment, indicating that certain genotypes can moderate sensitivity to stressors. In monkeys, impulsive aggression is correlated with low cerebrospinal fluid concentrations of 5-hydroxyindoleacetic acid (5-HIAA), which is involved in serotonergic metabolism. However, this inherited characteristic is modulated by attachment experiences: monkeys reared by their own mothers show higher concentrations of 5-HIAA than those reared by peers (Barr et al. 2004). People with an avoidant attachment style show decreased activity of the striatum and the ventral tegmental area, suggesting lack of response to social rewards. Conversely, people with a preoccupied attachment style show increased activity in the left amygdala, suggesting increased sensitivity to social punishment (Vrticka et al. 2008).

Broadly speaking, we may envision three types of association between aspects of social cognition and attachment, created by attachment relationships based on intense romantic and maternal love or by attachment relationships based on threat or fear: 1) Love-related activation of the attachment system, mediated by dopaminergic structures of the reward system in the presence of oxytocin and vasopressin, can inhibit the neural systems that underpin the generation of negative affect. 2) Threat-related activation of the attachment system (e.g., triggered by perceived threat, loss, or harm) may evoke intense arousal and overwhelming negative affect, bringing about an activation of posterior cortical and subcortical areas and switching off of frontal cortical activity, including mentalization. 3) Meanwhile, a secure and predictable attachment relationship may be most effective in preempting threat, which possibly reduces the need for frequent activation of the attachment system.

It is perhaps worth noting that Bowlby (1969) considered fear, in particular, fear of the loss of the attachment figure, to be the primary reason for activation of the attachment system. An unpredictable, insecure caregiver-infant relationship is likely to result in frequent activation of the attachment system accompanied by the deactivation of neural structures underpinning aspects of social cognition. Evidence also suggests that the level of attachment anxiety is positively correlated with activation in emotion-related areas of the brain (e.g., the anterior temporal pole, which is activated when a person is sad) and inversely correlated with activation in a region associated with emotion regulation (the orbitofrontal cortex) (Gillath et al. 2005). These findings suggest that anxiously attached people might under-recruit brain regions normally used to downregulate negative emotions.

Attachment Experience and Mentalization

Mentalization, the impulse and ability to understand and imagine other people's thoughts, is one of humanity's most distinguishing and powerful characteristics. The first minds that are offered to infants to ponder on and attempt to decipher are,

of course, those of their closest family—primarily the major attachment figures. These individuals provide the earliest lessons in how other people think and also, through their reactions to the infant, formative lessons in how their thoughts are interpreted by others. The mentalization model concerns itself with the parent's understanding and reflection on the infant's internal world, and it claims a central relationship between attachment processes and the growth of the child's capacity to understand interpersonal behavior in terms of mental states (Fonagy et al. 2002).

Mentalization-based treatment has its roots in attachment theory. The focus of the approach is provided by attachment theory–inspired developmental research into the growth of understanding of mental states in self and other. The mentalization model was first outlined in the context of a large empirical study in which security of infant attachment with parents proved to be strongly predicted not only by the parents' security of attachment during the pregnancy (Fonagy et al. 1991) but even more by the parents' capacity to understand their own childhood relationships with their own parents in terms of states of mind (Fonagy et al. 1991). The capacity to mentalize is a key determinant of self-organization and affect regulation, and it emerges in the context of early attachment relationships. The concept of mentalization postulates that one's understanding of others depends on whether one's own mental states were adequately understood by caring, attentive, nonthreatening adults. Problems in affect regulation, attentional control, and self-control stemming from dysfunctional attachment relationships (Agrawal et al. 2004; Lyons-Ruth et al. 2005; Sroufe et al. 2005) are mediated through a failure to develop a robust mentalizing capacity (Bateman and Fonagy 2010). Mental disorders in general can be seen as the mind misinterpreting its own experience of itself and therefore of others (Bateman and Fonagy 2010).

Mentalization involves both a self-reflective component and an interpersonal component, is both implicit and explicit, and concerns both feelings and cognitions. In combination, mentalization skills enable a child to distinguish inner from outer reality, construct representations of his or her own mental states from perceptible cues (arousal, behavior, context), and infer and attribute others' mental states from subtle behavioral and contextual cues. The full development of mentalization depends on interaction with more mature and sensitive minds; there is growing evidence that links mentalization to the quality of attachment relationships.

Many studies support the suggestion that secure children are better than insecure children at mentalization (measured by Theory of Mind tasks) (see, e.g., de Rosnay and Harris 2002). Children with secure attachment relationships assessed by the Separation Anxiety Test do better than children with disorganized attachment on a test of emotion understanding. The first of these findings, reported from the London Parent-Child Project (Fonagy et al. 1997), found that 82% of children who were secure with the mother in the Strange Situation passed Harris's Belief-Desire Reasoning Task at 5.5 years, compared with 50% of those who were avoidant and 33% of the small number who were preoccupied. Findings along these lines are not always consistent (see, e.g., Meins et al. 2002), but it generally seems that secure attachment and mentalization are subject to similar social influences.

Two decades of research have confirmed parenting as the key determinant of attachment security; more recent work

additionally suggests that parenting can account for the overlap between mentalization and attachment security. Researchers describe the mother's capacity to take a psychological perspective on her child using different terms, including *maternal mind-mindedness, insightfulness,* and *reflective function.* These overlapping attributes appear to be associated with both secure attachment and mentalization (Sharp et al. 2006). Meins et al. (2001), Oppenheim and Koren-Karie (2002), and Slade et al. (2005) have sought to link parental mentalization with the development of affect regulation and secure attachment by analyzing interactional narratives between parents and children. Although Meins and colleagues assessed parents' quality of narrative about their children in real time (while the parents were playing with their children) and Oppenheim and Koren-Karie did this in a more "offline" manner (with parents narrating a videotaped interaction), both concluded that maternal mentalizing was a more powerful predictor of attachment security than, say, global sensitivity. Meins and colleagues found that mind-related comments by mothers when a child was age 6 months predicted attachment security at 12 months (Meins et al. 2001), mentalizing capacity at 45 and 48 months (Meins et al. 2002), and performance in a stream-of-consciousness task at 55 months (Meins et al. 2003). Oppenheim and Koren-Karie (2002) found that a secure mother-child relationship was predicted by high levels of mentalization about the child's behavior.

Slade et al. (2005) observed a strong correlation between infant attachment and the quality of the parent's mentalizing about the child. Rather than using an episode of observed interaction, these authors used an autobiographical memory–based interview about the child, the Parent Development Interview (PDI). High scorers on the PDI's mentalizing (Reflective Functioning) scale are aware of the characteristics of their infant's mental functioning, and they grasp the complex interplay between their own mental states and their child's putative inner experience. They are likely to have secure relationships with infants whom they describe in a mentalizing way. Low-mentalizing mothers were more likely to show atypical maternal behavior on the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE) system, which relates not only to infant attachment disorganization but also to unresolved (disorganized) attachment status in the mother's AAI (Grienenberger et al. 2005).

Taken together, these results suggest that a mentalizing style of parenting facilitates the development of mentalization. Mindful parenting probably enhances both attachment security and mentalization in a child. Consistent with this is a range of findings covering aspects of parenting that have been shown to predict performance on Theory of Mind tasks. Precocious understanding of false beliefs is predicted by more reflective parenting practices, including the quality of parental control, parental discourse about emotions, the depth of parental discussion involving affect, parents' beliefs about parenting, and non-power-assertive disciplinary strategies that focus on mental states (e.g., a victim's feelings or the non-intentional nature of transgressions). All of these measures reflect concern with the child's subjective state.

One should, however, be cautious about these correlations. They are as readily explained by child-to-parent effects as by parent-to-child effects. For instance, less power-assertive parenting may be associated with mentalization not because it facilitates it but because less mentalizing children are more likely to

elicit controlling parenting behavior. Moreover, the same aspects of family functioning that facilitate secure attachment may also facilitate the emergence of mentalizing. For example, tolerance for negative emotions is a marker of secure attachment and precocious mentalizing. The process of acquiring mentalization is so ordinary and normal that it may be more correct to consider secure attachment as removing obstacles to it rather than actively and directly facilitating its development. Coherent family discourse characteristic of secure attachment helps to generate explanatory schemas with which the behavior of others can be understood and predicted. It is fair to say that in normal circumstances, conversations with frequent accurate elaboration of psychological themes may be the "royal road" to understanding minds (Harris 2005). Main's (2000) groundbreaking work has linked attachment to this kind of communication with words. The key to understanding the interaction of attachment with the development of mentalization may be to look at instances in which normally available catalysts for mentalization are absent.

Maltreatment disorganizes the attachment system. There is also evidence to suggest that it may disrupt mentalization. Young maltreated children manifest certain characteristics that could suggest problems with mentalization: 1) they engage in less symbolic and dyadic play; 2) they sometimes fail to show empathy when witnessing distress in other children; 3) they have poor affect regulation; 4) they make fewer references to their internal states; and 5) they struggle to understand emotional expressions, particularly facial ones, even when verbal IQ is controlled for. Maltreated children tend to misattribute anger and to show elevated event-related potentials to angry faces. Understanding sad and angry emotions at age 6 years predicts social competence and ability to avoid or cope with social isolation at age 8 (Rogosch et al. 1995).

In addition to reports of problems of emotional understanding, there have also been reports of delayed Theory of Mind understanding in maltreated children (Pears and Fisher 2005). The capacity to parse complex and emotionally charged representations of the parent and of the self might even deteriorate with development (Cicchetti et al. 2000).

Considered in relation to attachment, mentalization deficits associated with childhood maltreatment may be a form of decoupling, inhibition, or even a phobic reaction to mentalizing. The processes at work here are multiple: 1) adversity may undermine cognitive development in general; 2) mentalization problems may reflect arousal problems associated with exposure to chronic stress; and 3) the child may avoid mentalization to avoid perceiving the abuser's frankly hostile and malevolent thoughts and feelings about him or her.

Maltreatment can contribute to an acquired partial "mind blindness" by compromising open reflective communication between parent and child. Maltreatment may undermine the benefit derived from learning about the links between internal states and actions in attachment relationships (e.g., the child may be told that he or she "deserves," "wants," or even "enjoys" the abuse). This will more likely be destructive if the maltreatment is perpetrated by a family member. Even when this is not the case, parents' ignorance of maltreatment taking place outside the home may serve to invalidate the child's communications with the parents about his or her feelings. The child finds that reflective discourse does

not correspond to these feelings—a consistent misunderstanding that could reduce the child's ability to understand/mentalize verbal explanations of other people's actions. In such circumstances, the child is likely to struggle to detect mental states behind actions and will tend to see these actions as inevitable rather than intended. This formulation implies that treatments should aim to engage maltreated children in causally coherent psychological discourse.

These speculations clearly imply that the foundations of subjective selfhood will be less robustly established in individuals who have experienced early neglect. Such individuals will find it harder to learn about how subjective experiences inevitably vary between people. In some longitudinal investigations, low parental affection or nurturing in early childhood appears more strongly associated with elevated risk for borderline, antisocial, paranoid, and schizotypal PDs diagnosed in early adulthood than even physical or sexual abuse in adolescence (Johnson et al. 2006). A number of studies have pointed to the importance of neglect, low parental involvement, and emotional maltreatment rather than the presence of abuse as the critical predictor of severe PD (e.g., Johnson et al. 2001). Studies of family context of childhood trauma in BPD tend to see the unstable, non-nurturing family environment as the key social mediator of abuse (Bradley et al. 2005) and underinvolvement as the best predictor of suicide (Johnson et al. 2002) and personality dysfunction. Disturbance of attachment relationships, by inhibiting the capacity for mentalization, disrupts key social-cognitive capacities (the ability to conceive mental states as explanations for behavior in oneself and in others) and thus creates profound vulnerabilities in the context of social relationships. Mentalization appears to be the developmental mechanism for the connection between attachment problems and the difficulties often experienced in PD.

Natural Pedagogy and a Theory of the Differentiation of the Self

In the previous section, "Attachment Experience and Mentalization," we discussed how insecure and unpredictable attachment relationships may create an adverse social environment for the acquisition of mentalization. The theory of pedagogy explains how this acquisition or learning process is smoother for secure infants: it gives a theoretical and analytical underpinning to an understanding of the development of mentalizing and the growth of an agentive sense of self; conversely, it provides a powerful developmental explanation for how the social and interpersonal difficulties of PD might emerge.

Pedagogy theory predicts that young children will initially view everything they are taught as generally available cultural knowledge, shared by everyone (Csibra and Gergely 2006). Thus, when they are taught a word for a new referent, they do not need to check who else knows it. Young children assume that knowledge of subjective states is also common and that there is nothing unique about their own thoughts or feelings. A sense of the uniqueness of their own perspective develops only gradually.

The gradual nature of this development was underscored by developmental discussion of the phenomenon that has been termed the "curse-of-knowledge bias"; this refers to the common enough observation that if one knows something about the world, one expects

that everyone else should know it too (e.g., Birch and Bloom 2003). Young children commonly report that other children will know facts that they themselves have just learned. The curse-of-knowledge bias explains the apparent egocentrism of young children, who cannot appreciate another person's perspective: it is not the overvaluing of private knowledge, as Piaget's (1951) concept of egocentrism implies, but rather the undifferentiated experience of shared knowledge that hinders children from taking the perspective of the other. Children are correct to assume universal knowledge during development because their representations of their own subjectivity were indeed someone else's beliefs about the children before social mirroring enabled the children to make these representations their own. This phenomenon will gradually be less and less true as children mature, yet even as adults, individuals may occasionally catch themselves assuming that others think the same way they do.

Young children do not yet know that they can choose whether or not to share their thoughts and feelings with adults. Toddlers may be prone to tantrums because they fully expect other people to know what they are thinking and feeling and to see situations in the same way they do. Disagreement cannot yet be understood as the result of different points of view, so if adults thwart them, the adults must be either malign or willfully obtuse. Thus, conflict is not just hurtful but also intolerable and maddening because it denies this probably highly valued shared reality. What exists in the mind must exist "out there" and what exists out there must also exist in the mind. This "psychic equivalence," as a mode of experiencing the internal world, can cause intense distress because the projection of fantasy can be terrifying. The acquisition of a sense of the pretend in relation to mental states is therefore essential. Repeated experience of affect-regulative mirroring helps the child to learn that feelings do not inevitably spill out into the world: they are decoupled from physical reality. At first this decoupling is complete (what we have called the *pretend mode* [Fonagy and Target 2007]). While a child is focused on the internal, no connection with physical reality is possible. Only gradually, by engaging in playful interaction with a concerned adult who seriously entertains the child's pretend world, will the pretend and psychically equivalent modes integrate to form genuine subjectivity.

In understanding the emergence of mentalization, it is not necessary to account for how children come to understand that other people have minds. Children assume, once they acquire introspectively accessible representations, that this is always the case. Recent research on Theory of Mind using an adapted version of the displacement task suggests that awareness of other minds is present from as early as age 15 months (Kovacs et al. 2010). The new theoretical perspective of pedagogy theory focuses developmental attention on children's understanding that others have separate minds with different contents. The question is: What social conditions might help infants to learn when to suspend their default assumption of universal knowledge?

Pedagogy theory clarifies the role of early attachment relationships in the emergence of individual subjectivity and perspective taking. The establishment of subjectivity is linked to attachment via the overlap between consistent ostensive and accurate referential cueing and what attachment theorists have designated "sensitive parenting" (Fearon et al. 2006). By building second-order representations

on the one hand and providing mental reasoning schemes to make sense of action on the other, the relationship with the mind-minded reflective caregiver transforms the child's implicit and automatic mentalizing competence into an explicit, potentially verbally expressible, and systematized "theory of mind." Aspects of secure attachment (e.g., attunement sensitivity) appear to have a pedagogical function, teaching us what we cannot learn about the world through simple observation. Subjectivity, of course, belongs to this class of phenomena. Secure attachment and the mind-minded reflective mirroring environment extend awareness to include internal states, thereby making self-prediction and emotional self-control possible. Pedagogical referential communication applied to the domain of the emotional and dispositional/intentional states of the self creates the context wherein the caregiver can teach the child about the subjective self. The benign effects of secure attachment arise at least in part out of superior competence at ostensive cueing.

There is a second aspect of this process, however, in which the attachment relationship may play a crucial part: competition with other people, which is potentially a primary driver of the evolution of mentalization. The pedagogical function needs to be protected from deliberate misinformation by competitors who do not have genetic material in common with the infant and are therefore not invested in his or her survival. The 3- to 4-year-old child's sensitivity to false beliefs suggests that he or she has become aware not only that knowledge is not invariably shared but also that it is not necessarily communicated with benign intent. In Mascaro and Sperber's (2009) study, preschool children responded differentially to information supplied by a benevolent versus a malevolent communicator. Passing the false belief test—that is, "having a Theory of Mind"—was associated with sensitivity to information coming from positively versus negatively connoted sources.

A person monitors the mental states of others in part to establish the possible motivations behind any giving of information. The quality of the relationship between parent and child plays an important role in establishing one's capacity to do this. Children who have experienced disorganized attachment will be disadvantaged because of confusion about the possibility of trust. The secure child, by contrast, has already developed a robust sense of shared subjectivity and may also be most open to learn about the uniqueness and separateness of his or her self-experience. Attachment may well be a helpful behavioral marker of shared genetic makeup (Belsky and Jaffee 2006) and consequently a kind of "hallmark of authenticity of knowledge." The indications of generic cognitive benefits associated with secure attachment are in line with the assumption of more reliable processing of pedagogical information in caregiving environments that engender attachment security (Cicchetti et al. 2000).

In summary, we suggest that the advantage of secure attachment for the precocious development of mentalization and for the stronger establishment of an agentive sense of self is the consequence of the infant's general predisposition to learn from adults. As learning is triggered by ostensive cues that share characteristics with secure parenting, the teaching of secure infants may be smoother than that of insecure ones. By contrast, disorganized attachment interferes with ostensive cues and would be expected to disrupt learning. It is expected that the influence of secure attachment will be particularly crucial in

teaching the infant about his or her own subjectivity. Finally, the characteristics of communication associated with sensitive caregiving also reassure the infant about the trustworthiness of the information to be communicated. From an evolutionary standpoint, one may consider such ostensive cues (at least in infancy) to trigger a "basic epistemic trust" in the caregiver as a benevolent, cooperative, and reliable source of cultural information (Gergely 2007). This basic trust enables the infant to rapidly learn what is communicated without the need to test for social trustworthiness (Slade et al. 2005). Adults mainly teach infants they look after, whom they have genetic reasons to care for. Infants are also selective, identifying attachment figures to teach them what in the world is safe and trustworthy, and, furthermore, how they can think about their thoughts and feelings and how knowledge of such internal states can eventually make a bridge to understanding and prediction in the wider social world.

An Attachment Theory of Borderline Personality Disorder Based on Mentalization

To show that attachment theory can usefully be integrated to address clinical problems, we briefly review the mentalization-based theory and treatment of BPD (Bateman and Fonagy 2006; Fonagy and Bateman 2006). We consider the failure of mentalization within the attachment context to be the core pathology of BPD (Bateman and Fonagy 2004), and our treatment package aims to assist in its recovery (Bateman and Fonagy 2006).

The alternative model for PDs, provided in Section III of DSM-5 (American Psychiatric Association 2013), differs from the categorical approach expressed in DSM-IV and in DSM-5 Section II, "Diagnostic Criteria and Codes." This significant new model is pertinent here because it is conceptually quite congruent with key findings of attachment theory–based research on PDs. The alternative DSM-5 model describes PDs according to two primary criteria. Criterion A constitutes impairments in personality *functioning*, both personal self-functioning and interpersonal functioning. Functioning can be evaluated on a continuum that determines levels of impairment. Criterion B constitutes pathological personality *traits*—that is, tendencies to behave or think in certain ways, which may rise and fall across life according to circumstances and experience. Disturbances in self and interpersonal functioning (Criterion A) are thus central components in the conceptualization and diagnosis of PD. Self-functioning encompasses an individual's identity and sense of self-direction; interpersonal functioning encompasses empathy and the capacity for intimacy. Both of these fundamental elements of personality function are generated by attachment relations: secure attachment develops the clarity of identity and a distinct set of boundaries between self and other that are necessary for this aspect of healthy self-functioning. Similarly, the sense of agency in the secure child enables him or her to set and aspire to reasonable goals using appropriate behaviors and to reflect constructively on his or her own experience. In the arena of interpersonal functioning, secure attachment drives the development of mentalization—the ability to understand other people's emotions and motivations accurately—and provides a working model for forming intimate and enduring relationships. Conversely, impairments in

both self-functioning and interpersonal functioning are adaptations to insecure attachment experiences. Many of the features of insecure attachment in adulthood correlate with the impairments in functioning described in Section III of DSM-5: a weak or distorted self-image, a limited capacity to regulate affect, incoherent or unrealistic goal setting, the inability to consider and comprehend others' feelings or motivations (the inability to mentalize), and a diminished capacity for enduring and reciprocal intimacy in interpersonal relationships.

In cases of BPD, individuals have schematic, rigid, and sometimes extreme views, which make them vulnerable to powerful emotional storms and apparently impulsive actions and which can create profound problems of behavioral regulation, including affect regulation. In our model of the failure of mentalization in BPD, the role of the attachment environment is considered alongside constitutional vulnerabilities. The vulnerability reflected in the heritability of BPD may be directly linked to the capacity for mentalization or may represent the fragility of this capacity in situations of environmental deficiency, as exemplified by severe neglect, psychological or physical abuse, childhood molestation, or other forms of maltreatment.

As we considered earlier in the section "Attachment Experience and Mentalization," mentalization may be temporarily inhibited by strong emotional arousal, by the intensification of attachment needs, or by a defensive turning away from the world of hostile and malevolent minds in the context of severe maltreatment. Mentalization deficit associated with maltreatment may not necessarily reflect incapacity but rather a form of decoupling, inhibition, or even a phobic reaction to mentalizing in maltreated individuals. There are multiple possibilities, of which we list two examples here. First, the reluctance to conceive of mental states on the part of maltreated individuals might be understandable given the hostile and malevolent thoughts and feelings that the abuser must realistically hold to explain his or her actions against a vulnerable young person. Consistent with this assumption, forms of maltreatment that are most clearly malevolent and clearly target the child (i.e., physical, sexual, and psychological abuse) have the greatest impact on mentalization. Second, it could be argued that adversity undermines cognitive development in general. Certainly, there is strong evidence to suggest that addressing issues of maltreatment in parent-child relationships can facilitate the child's cognitive development (Cicchetti et al. 2000). Our current model stresses that minor experiences of loss or relatively small emotional upsets without expectation of being comforted may be enough to cause intense activation of the attachment system in these individuals. Their attachment system is hyperactivated, probably because of interpersonal experiences associated with childhood trauma. This state of arousal inhibits mentalization and, combined with an unstable capacity for affect regulation, triggers the typical symptoms of the disorder.

There is ample evidence that maltreatment puts children at risk of profound deficits in the skills required to negotiate social interactions with peers and friends. These deficits are broad ranging and may affect verbal ability, the comprehension of emotional stimuli and situations, and possibly also Theory of Mind. We have seen that the level of mental state understanding (particularly emotion understanding) is closely linked to the extent to which emotions are openly discussed in the mother-child dyad or can be discussed given the child's deficits and the parents' ability to overcome them. We

may then argue that maltreatment acts on mentalization in many ways; it compromises the unconstrained, open reflective communication between parent and child or indeed between child and child. Maltreatment undermines the parent's credibility in linking internal states and actions. This limitation in communication is not hard to comprehend and could hardly be otherwise if the maltreatment is perpetrated by a family member. However, even in cases where maltreatment is not perpetrated by a family member, the centrality of the maltreatment experience for the child, coupled with the oversight on the part of the parent of the maltreatment that the child encounters outside the home, could serve to invalidate the child's communications with the parent concerning the child's subjective state. Thus, apparently reflective discourse will not correspond to the core of the child's subjective experiences, and this discrepancy moderates or reduces the facilitative effect of mentalizing verbal rationalizations of actions in generating an intentional as opposed to a teleological orientation. The formulations advanced here imply that therapeutic interventions should aim to engage maltreated children in causally coherent psychological discourse within appropriate contexts. The more reliable processing of pedagogical information in the context of secure attachment would account for the broad and generic intellectual benefits that appear to accrue from secure attachment in infancy.

Insecure and unpredictable attachment relationships between parent and infant may create an adverse social environment for the acquisition of mentalization or "mind reading" in the child. This may to a limited extent be adaptive, in that within extreme social contexts mentalization is a less useful strategy. If parent-child interaction is in crucial respects not genuine, the child might well be deconditioned from using mentalization as his or her predictive strategy. Severely insecure, abusive, inconsistent, and disorganized attachment relations may well be detrimental for mentalization to survive as a dominant, predictive interpersonal strategy. However, within the same contexts of deprivation and risk, mentalization could hold the key to breaking the cycle of abuse and deprivation for that child growing up and for the children he or she may go on to produce.

We see the capacity to mentalize as particularly helpful when people have been traumatized. Mentalization of experiences of adversity can moderate their negative sequelae (Fonagy et al. 1996). The capacity to mentalize enables those who are subjected to traumatic experiences to hold back modes of primitive mental functioning. It makes conceptual sense, therefore, for mentalizing to be a focus for therapeutic intervention if therapists are to help patients with BPD bring primitive modes of mental functioning under better regulation and control.

Attachment and Treatment Outcome for Personality Disorders

A child who is securely attached has had his or her acute affective states consistently reflected back to him or her in an accurate, but not overwhelming, manner. This repeated mirroring enables the infant to develop an increasing capacity for mental processing, particularly mentalization. In other words, it allows the individual to imagine that others have a mind that is essentially like his or her own and to interpret and respond to oth-

ers' feelings. The emergence of spoken language about feelings seems to be related to the attachment figure's ability to put the child's mental experience into words. Securely attached children seem to acquire speech more rapidly and remain more verbally competent than insecure children. Conversely, insecure attachment leads to developmental impairment of the internal state lexicon and to subsequent alexithymia in adulthood. Effective therapies must therefore include a component that allows patients to recognize, label, and verbally communicate their feelings.

On the basis of empirical evidence demonstrating that insecure attachments are risk factors for PDs and other mental illnesses, researchers have taken an interest in the relationship between attachment and psychotherapeutic success. It is widely accepted that attachment characteristics influence psychotherapeutic outcomes, but results are inconsistent. Most studies show that securely attached patients obtain better results (Cartwright-Hatton et al. 2011), but others indicate better outcomes for avoidant and disorganized patients (Fonagy et al. 1996).

The largest meta-analysis on the influence of attachment on psychotherapeutic outcome in various diagnoses (including PDs) and heterogeneous psychotherapeutic orientations consistently found that although attachment anxiety negatively affects outcome, attachment avoidance has no effect. This meta-analysis confirmed that higher attachment security predicts better therapeutic outcomes (Levy et al. 2011).

In addition to affecting symptomatic outcomes, attachment is associated with treatment dropout. Adult avoidant attachment constitutes a risk for dropout because patients are not fully committed, attached, or engaged with the therapist or the treatment. Psychotherapy can be seen as a threat to these patients' defensive apathy, and a negative transference pattern may emerge. Contrastingly, preoccupied patients are at risk of dropout after perceived abandonments such as emergency cancellations or scheduled vacations. Fearfully preoccupied individuals are prone to dropout in response to feeling attached to or dependent on the therapist and treatment (Levy et al. 2011).

Attachment also influences the therapeutic alliance, which in turn has important effects on outcome. Whereas secure patients perceive their therapists as responsive and emotionally available, avoidant/fearful patients are reluctant to make personal disclosures, feel threatened, and suspect that the therapist is disapproving. Preoccupied patients wish for more contact with the therapist and may seek to expand the relationship beyond the bounds of therapy (Levy et al. 2011).

Following Bowlby's attachment theory, both protection-seeking *and* caregiving behavior are influenced by attachment (Bowlby 1988). Therefore, the therapist's attachment style also influences the process and outcome of treatment. Therapists with anxious attachment styles create strong therapeutic alliances, but the quality of the alliance decreases with time when patients show interpersonal distress. Sessions between an avoidant therapist and an anxious patient attain less depth.

Some studies have shown changes in patients' attachment resulting from treatment. Fonagy et al. (1995) reported on a sample of patients with BPD under psychodynamic treatment. After treatment, 40% of the patients were classified as secure; none of the patients had this classification before treatment. A multisite study of several inpatient group psychotherapies found consistent improvement

of attachment security after 9 weeks of treatment, compared with nonclinical controls, that was maintained at 1-year follow-up (Kirchmann et al. 2012). In a randomized controlled trial of transference-focused psychotherapy, dialectical behavior therapy, and supportive therapy, only transference-focused psychotherapy achieved an increased number of patients classified as secure after treatment (Levy et al. 2006). A successful treatment does not necessarily imply attaining a secure attachment style, however: female patients with BPD whose attachment style changed from ambivalent to avoidant have shown improved symptomatic results at the end of short-term therapy (Strauss et al. 2011).

Conclusion

Building on the scientific cogency and fruitfulness of attachment research, attachment theory is now being increasingly translated into clinical settings. Recent work has demonstrated how practitioners can profit from the use of simple measures of attachment in order to tailor their interventions to maximize gains and minimize iatrogenic effects, a common difficulty in the treatment of PDs (Adshead 2010; Adshead et al. 2012; Conradi et al. 2011; Davila and Levy 2006; Levy et al. 2011; Westen et al. 2006). Mental health interventions can often stimulate the attachment needs of patients but may not provide the necessary protection and structure required to deal with the consequences of activating attachment systems, ranging from dropout to suicide (Levy et al. 2012; Spinhoven et al. 2007). The concept of a "secure base"—from which to start a curative change in relationship representations—needs to be integrated into approaches to treatment.

Secure attachment is built on the confident expectation that distress will be met with comfort and reassurance. But beyond this, because secure attachment facilitates the emergence of psychic structures linked to emotion, the entire representational system is likely to be more stable and coherent with a history of generally secure attachment experiences. The way people experience thoughts, including attachment-related thoughts and the cognitive structures that underpin them, may be seen as linked to physical aspects of early infantile experience. Attachment immediately takes center stage once research recognizes the physical origins of thought. It is possible now to see insecure patterns of attachment as adaptations that maximize the chances of survival of the infant to reproductive maturity despite adverse conditions for child rearing: continuing to cry when comforted may bring vital resources when individual attention is a rare commodity.

Missing out on early attachment experience creates a long-term vulnerability from which the child may never recover; the capacity for mentalization is never fully established, leaving the child vulnerable to later trauma and unable to cope fully with attachment relationships. More importantly, by activating attachment, trauma will often disrupt mentalization. This, of course, is further exacerbated when the trauma is attachment trauma. Attachment is the evolutionary instrument for humanity's most defining feature: the capacity for a complex social understanding both of oneself and of others.

The resistant pattern of attachment, characterized by an exaggeration of distress to ensure care, is linked to preoccupied states of mind in relation to attachment, usually involving anger or passivity. The common markers in the AAI include unfinished, run-on, or entangled sentences. The gesture that is ex-

pressed is one of needing to hold on yet not being satisfied. Losing track of the interview question and rambling on to irrelevant topics is a mental gesture that expresses a feeling of being lost or perhaps the very act of losing. Loss is also expressed at gesture language level by both the listener and the speaker feeling lost in the narrative. Anger, aimed at involving the interviewer, is a hallmark of a subcategory of such interviews.

Work in cognitive science has increasingly shown that the brain is the organ of the mind and that disorders of the mind are also disorders of the brain. Attachment relationships have a unique brain representation, and empathy and sensitivity depend on the effective functioning of specific brain centers. Considerable evidence is accumulating that disorders of the capacity to form relationships with one's infants or in adulthood can be characterized meaningfully at the level of brain activation. Attachment turns out to be more firmly embedded in the interface of bodily and environmental contexts than was appreciated in the cognitive science of the 1970s.

Attachment theory draws together the psychological, psychiatric, social, and neuroscientific work on PDs. Across recent decades, the research base and explanatory importance of attachment theory have been consolidated. In drawing this information together in this chapter, we have sought to demonstrate how the difficulties expressed in PDs can be understood as mentalizing failures. Insecure attachment relations obstruct the development of the capacity for mentalization via the disturbance of infants' natural disposition to learn from their primary attachment figures: in other words, the "pedagogical function" is disrupted.

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