Chapter 2

Why are we interested in attachments?

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Introduction

Attachment theory describes the ways in which individuals handle their most intimate relationships with their parents, children and life-partners: their attachment figures. When people are at their most vulnerable, frightened or unwell, they will, in different ways, seek comfort and help. This seeking out of help, and the different styles used to obtain help, constitute the attachment process. Attachment, at an evolutionary level, is a basic adaptation for survival – it is the mechanism by which babies elicit essential care. As we understand more, however, about the interface of brain development and early psychosocial experience it becomes clear that the evolutionary role of the attachment relationship goes far beyond giving physical protection to the human infant.

From birth, the interactions of an infant with their primary carers will establish a base for personality development and will mould subsequent close relationships, expectations of social acceptance, and attitudes to rejection. A secure base is formed when the attachment figure (usually the mother) provides stability and safety in moments of stress, which allows the infant to explore his/her surroundings. In this way, the child constructs mental models of him/herself and of others in social interactions ('internal working models'). These working models are formed into their own distinctive shape by the kinds of the interactions he/she experiences from his/her primary attachment figures (Bowlby 1973).

These early attachment experiences are the tools that the mind uses to forge its capacity for affect and stress regulation, attentional control, mentalisation, and self-agency (Fonagy *et al.* 2010). In other words, the major long-term selective advantage conferred by attachment is the opportunity to develop the sophisticated human social intelligence that physical and emotional nearness to concerned adults affords. Attachment ensures that the brain processes serving social cognition are appropriately organised and prepared to equip the individual for the collaborative and cooperative existence with others for which the brain was designed (Fonagy 2003a).

The brain is experience-expectant (Siegel 1999); thus, processes as fundamental as gene expression or changes in neuron receptor densities can be influenced by the

infant's environment (e.g. Meaney & Szyf 2005). In other words, we are interested in attachments because not only are they normative and necessary for human (and mammalian) survival, they are increasingly understood as providing both the neurological and the psychological framework for the development of personality.

Attachment research has been based on the Strange Situation procedure (SSP) for infants (developed by Mary Ainsworth) and its corollary for assessing adults, the Adult Attachment Interview (AAI) (first developed by Mary Main and her colleagues). These assessment tools are described in detail in the *Routledge Handbook of Attachment: Assessment* (Farnfield & Holmes 2014).

In the SSP infants are briefly separated from their caregivers and left with a stranger in an unfamiliar setting. The way they respond falls into three distinct patterns of behaviour: secure (63% of children in various community samples); anxious/resistant or ambivalent (16%); and avoidant (21%). In adults, attachment style is respectively classified as secure/autonomous (58% of the non-clinical population), avoidant/dismissing (23%), and anxious/preoccupied (19%) (Main *et al.* 1985; Bakermans-Kranenburg & Van IJzendoorn 2009). More recent research has revealed a fourth pattern, disorganised attachment (Main & Solomon 1986; Levy *et al.* 2011).

A *securely attached* infant during the SSP readily explores his/her new surroundings in the primary caregiver's presence, shows anxiety in the stranger's presence, is distressed by the caregiver's brief absence, rapidly seeks contact with the caregiver upon reunion, and is reassured by renewed contact, rapidly reassuming exploration. Likewise, an adult categorised as secure/autonomous during the AAI coherently integrates attachment memories into a meaningful narrative and shows appreciation for attachment relationships.

An *anxious/avoidant* infant appears less upset at separation, might not seek contact with the caregiver on his/her return, and might not prefer the caregiver to the stranger. In adults, *avoidant/dismissing* AAI narratives will lack coherence; patients will be unable to recall specific memories in support of general arguments and will idealise or devalue their early relationships (Fonagy *et al.* 2010). These behaviours appear as the result of a hyper-deactivation of the attachment system characterised by inhibition of proximity-seeking and a determination to handle stress alone, which implies a clear attempt to inhibit negative emotions through a non-interpersonal way of regulating them (Barone *et al.* 2011).

An *anxious/resistant* infant shows limited exploration and play, seems highly distressed by the separation, and does not easily settle after reunion. Correspondingly, an *anxious/preoccupied* adult's AAI narratives will show confusion, anger, or fear in relation to early attachment figures (Fonagy *et al.* 2010). This corresponds to the hyper-activation of proximity-seeking and protection-seeking strategies, to a (chronic) hypersensitivity to signs of possible rejection of abandonment, and to an intensification of undesirable emotions (Barone *et al.* 2011).

A *disoriented/disorganised* infant will show undirected or bizarre behaviour such as freezing, hand clapping or head banging. The infant might try to escape the situation. Comparably, an *unresolved/disorganised* adult's 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 partial or even pervasive emotion dysregulation.

The relationship between styles of attachment and personality development

Bowlby proposed that internal working models of the self and others developed in infancy provide prototypes for all later relationships. And, indeed, recent attachment research has shown that these styles of attachment behaviour do remain strikingly consistent across life (Bakermans-Kranenburg & Van IJzendoorn 2009): there is a 68–75 per cent correspondence between attachment classification in infancy and in adulthood (Fonagy *et al.* 2010). Individual differences in attachment classification have been studied in relation to an exceptionally wide range of later outcomes, spanning cognitive capacities such as verbal IQ, interpersonal capacities and psychopathology.

The most important predictor of attachment style change during life is negative early life events, such as loss of a parent, parental divorce, life-threatening illness of a parent or child, parental psychiatric disorder, physical maltreatment, or sexual abuse (Johnson *et al.* 1999; Waters *et al.* 2000).

The stable nature of attachment styles accounts for the development of enduring strategies to regulate emotion and social contact. For example, the increased control of the secure child permits him/her to move toward the ownership of inner experience, and toward an understanding of self and others as intentional beings whose behaviour is organised by mental states, thoughts, feelings, beliefs and desires. Consistent with this, prospective longitudinal research has demonstrated that children with a history of secure attachment are independently rated as more resilient, self-reliant, socially oriented, and empathic to distress, with deeper relationships and higher self-esteem. Securely attached individuals trust their attachment figures and perceive little environmental threat; as a result, they can respond appropriately to environmental challenges and are able to process emotions in a fluid and non-defensive way (Nolte *et al.* 2011).

Dismissing individuals may have a higher threshold for experiencing negative emotions or perceiving attachment needs, exhibiting what Bowlby called 'compulsive self-reliance' (Bowlby 1980: 365). Preoccupied individuals, who are 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. Hence, they are likely to manifest compulsive care-seeking and over-dependency.

Unresolved/disorganised individuals – the adult analogue of disorganised/disoriented infants – frequently have parents who are themselves abusive or unresolved regarding their own losses or abuse experiences (Lyons-Ruth & Block 1996; Botbol 2010; Fonagy & Target 2005; Slade *et al.* 2005).

Evidence linking attachment in infancy with more general personality characteristics is stronger in some studies than in others. Findings from the Minnesota Study cohort show a prediction from infantile attachment insecurity to adult measures of psychiatric morbidity, with many potential confounding factors controlled for, linking attachment insecurity and adversity to indications of personality disorder (PD) (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 externalising (such as overt anger) problems than those who are secure with at least one parent.

However, in contrast to Bowlby's prediction, the avoidant and resistant classifications tend not to be strongly related to later measures of maladaptation although there is also some evidence to suggest a connection between avoidance and internalising conditions such as depression and anxiety (Groh *et al.* 2012).

It is the disorganised/disoriented infant category which appears to have the strongest predictive significance for later psychological disturbance (Fearon *et al.* 2010).

Evidence is accumulating that long-term physical health may be influenced by early attachment through a person's immune response as well as the now well-accepted links to future psychopathology or mental health resiliency. For example, the prevalence of obesity in adolescence was found to be more than twice as high among youth with poor-quality early relationships than those with better relationships (Anderson *et al.* 2012). At this point it is important to recall that the classification of attachment is a summary variable that incorporates various qualities of mother/infant relationship. In this study low maternal sensitivity was more strongly associated with later obesity than insecure attachment. A 32-year study reported insecurity at 12–18 months to be associated with increased risk of inflammatory illnesses in adulthood (Puig *et al.* 2012).

It is easy to alight on the negative outcomes of insecure attachment and forget about the evolutionary functions, the biological nature of the mechanisms underpinning it, which are ultimately oriented toward optimising the chances of reproduction (Hamilton 1964). The findings of Belsky, Routs and Fearon (2010), who followed 373 women enrolled in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development Study, is poignant. Annual physical examinations from the ages of 9.5 years to 15.5 years revealed that individuals who had been insecure infants initiated and completed pubertal development earlier and had an earlier age of menarche compared with individuals who had been secure infants, even after accounting for age of menarche in the infants' mothers.

Insecure attachment may indicate environmental adversity. Early procreation might be an adaptive strategy to deal with the reduced likelihood of survival in a combative challenging environment. This kind of observation raises questions about the biological mechanisms responsible for the attachment effects and these are considered below.

Attachment, biology and social cognition

The neurobiology of attachment is now fairly well understood (as will be discussed further by Graham Music in Chapter 7). Attachment has evolved to change the internal (stress/fear response mediated by noradrenaline through the amygdala and insula, and cortisol via the hypothalamic–pituitary–adrenal [HPA] axis) and external conditions associated with threats to the survival of the organism. Distress triggers an attachment signal from the infant, who seeks to counter threat and avoid harm by evoking proximity, and a matching regulating, protective response from a caretaker disposed to reciprocate, form emotional bonds, mentalise, and teach (i.e. contingent, attuned, marked mirroring from the caretaker).

Mother–infant, infant–mother, and romantic-partner attachment have a shared neurobiological basis (that is there is a reciprocal response in each individual). This is linked to the mesocorticolimbic dopaminergic reward circuit, which also plays a key role in mediating the process of physical (as well as emotional) addiction: attachment can be thought of as an 'addictive disorder' (Insel 2003).

Two major neural systems have been shown to play a critical role in attachment behaviours: the dopaminergic reward-processing system and the oxytocinergic system (Fonagy *et al.* 2011). The role of the dopaminergic reward system in attachment behaviour is understood as an evolutionary mechanism to motivate reproductive mating, maternal care and, ultimately, offspring survival. It leads individuals to seek close relations with other humans and produces satisfaction when they are attained.

Broadly speaking, we may envisage three types of association between aspects of social cognition and attachment. These are created by (a) attachment relationships based upon intense romantic and maternal love, (b) attachment relationships based upon threat/fear, and (c) secure and predictable attachment relationships. Although any given attachment relationship can have features of each of these three possibilities, they are important to distinguish, as the relationship between attachment activation and mentalising can differ considerably depending on which feature is activated within an attachment relationship. The three cognitive processes connected with attachment are:

1 Mediated by dopaminergic structures of the reward system in the presence of oxytocin and vasopressin, the love-related activation of the attachment system can inhibit the neural systems that underpin the generation of negative affect.
2 The threat-related activation of the attachment system (e.g. triggered by perceived threat, loss, or harm) might also evoke intense arousal and overwhelming negative affect, bringing about an activation of posterior cortical and subcortical areas and switching off frontal cortical activity including mentalisation (Arnsten 1998; Arnsten *et al.* 1999; Mayes 2000).
3 Meanwhile, a secure and predictable attachment relationship might be most effective in *pre-empting* threat, which possibly reduces the need for frequent activation of the attachment system.

It is perhaps worth noting that Bowlby assumed fear, in particular fear of the loss of the attachment figure, to be the primary reason for activation of the attachment system (Bowlby 1959, 1969, 1973). 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 we are sad) and inversely correlated with activation in a region associated with emotion regulation (the orbitofrontal cortex) (Gillath *et al.* 2005). These findings suggested that anxiously attached people might under-recruit brain regions normally used to downregulate negative emotions.

Adult attachment experiences and mentalisation

Bowlby's theory of attachment was famously met with a barrage of almost unanimous criticism from the usually divided world of psychoanalysis; this intellectual standoff was compounded when Bowlby himself responded to this denunciation with an equally bullish stance. But in the past 10 to 15 years, there has been a conspicuous and highly creative rapprochement: a slew of new work has appeared that integrates psychodynamic clinical work with attachment theory and research. This interest in attachment has consolidated so exponentially because the theory provides such a convincing overarching framework for understanding and elaborating the processes by which the human mind is able to explore the subtleties of subjectivity; of who we are and how we interact with other people.

Attachment theory cannot and does not aspire to specify the full richness of the subjective contents that preoccupy the ordinary mind, let alone the mind in distress. Few attachment theorists would claim that Bowlby's theory, even with its recent elaborations, can provide a full account of human motivation and experience, which is the declared aim of a psychoanalytic psychology. Nevertheless, it is also evident that the gulf between the two is narrowing rapidly.

A relatively new concept, mentalisation-based theory and treatment, further integrates psychoanalytic thinking with attachment theory and research. Mentalisation, which is considered in more detail by Luyten and Fonagy in Chapter 6, is the impulse to understand and imagine both our own and other people's thoughts; it is one of humanity's most pervasive and powerful characteristics. The first minds that small children are presented with, to wonder about and interpret, are of course those of their most intimate family. This family – primarily the major attachment figures – provides the earliest formative lessons in other people's thinking, and also, through these people's reactions, for learning about how our thoughts are perceived: who we are imagined to be by others. The mentalisation model specifically concerns itself with the parent's understanding and reflection on the infant's internal world, and claims a vital relationship between attachment processes and the growth of the child's capacity to understand interpersonal behaviour in terms of mental states (Fonagy *et al.* 2002).

Understanding the relationship between attachment and mentalising

Many studies support the suggestion that secure children are better than insecure children at mentalisation (measured as passing theory of mind tasks earlier) (see, e.g., de Rosnay & Harris 2002). Children with secure attachment relationships assessed by the Separation Anxiety Test do better than children with disorganised attachment on a test of emotion understanding (Fonagy *et al.* 1997a). The first of these findings, reported from the London Parent–Child Project (Fonagy *et al.* 1997b), found that 82 per cent of children who were secure with the mother in the SSP passed Harris' Belief-Desire-Reasoning Task at 5.5 years, compared with 50 per cent of those who were avoidant and 33 per cent 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 mentalisation are subject to similar social influences. Two decades of research have confirmed parenting as the key determinant of attachment security. Can certain aspects of parenting account for the overlap between mentalisation 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 (RF). These overlapping attributes appear to be associated with both secure attachment and mentalisation (Sharp *et al.* 2006). Meins *et al.* (2001), Oppenheim and Koren-Karie (2002), and Slade (Slade *et al.* 2005) have sought to link parental mentalisation with the development of affect regulation and secure attachment by analysing interactional narratives between parents and children. Although Meins assessed parents' quality of narrative about their children in real time (while the parents were playing with their children) while Oppenheim's group did this in a more 'offline' manner (parents narrating a videotaped interaction), both concluded that maternal mentalising was a more powerful predictor of attachment security than, say, global sensitivity. Meins and colleagues found that mind-related comments by mothers at six months predicted attachment security at 12 months (Meins *et al.* 2001), mentalising 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 mentalisation about the child's behaviour.

Slade and colleagues (2005) also observed a strong association between infant attachment and the quality of the parent's mentalising about the child. Rather than using an episode of observed interaction, Slade *et al.* used an autobiographical memory-based interview about the child, the Parent Development Interview (PDI). High scorers on the PDI's mentalising scale are aware of the characteristics of their infant's mental functioning, and they grasp the complex interplay between their own mental states and the child's putative inner experience. They are likely to have secure relationships with infants whom they describe in a mentalising way. Low mentalising mothers were more likely to show atypical maternal behaviour

on the AMBIANCE (Atypical Maternal Behaviour Instrument for Assessment and Classification) system (Bronfman *et al.* 1999), which relates not only to infant attachment disorganisation but also to unresolved (disorganised) attachment status in the mother's AAI (Grienenberger *et al.* 2005).

Taken together, these results suggest that a mentalising style of parenting might well facilitate the development of mentalisation. Mindful parenting probably enhances both attachment security and mentalisation in a child. These findings are of significance when considering social or therapeutic interventions (see *The Routledge Handbook of Attachment: Implications and Interventions* (Holmes & Farnfield 2014)).

The process of acquiring mentalisation is so ordinary and normal that it might 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 (Hill *et al.* 2003) helps to generate explanatory schemas by means of which the behaviour of others can be understood and predicted. It is fair to say that, under normal circumstances, conversations with children which include frequent accurate elaboration of psychological themes could 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 mentalisation might be to look at instances where normally available catalysts for mentalisation are absent.

Mentalisation and maltreatment

Maltreatment disorganises the attachment system (see Cicchetti & Valentino 2006 for a comprehensive review). There is also evidence to suggest that it may disrupt mentalisation. Young maltreated children manifest certain characteristics that could suggest problems with mentalisation:

1 they engage in less symbolic and dyadic play (Alessandri 1991);
2 they sometimes fail to show empathy when witnessing distress in other children (Klimes-Dougan & Kistner1990);
3 they have poor affect regulation (Maughan & Cicchetti 2002);
4 they make fewer references to their internal states (Shipman & Zeman 1999);
5 they struggle to understand emotional expressions, particularly facial ones (During & McMahon 1991), even when verbal IQ is controlled for (Camras *et al.* 1990).

Maltreated children tend to misattribute anger (Camras *et al.* 1996) and show elevated event-related potentials to angry faces (Cicchetti & Curtis 2005). The evidence for significant developmental delay in the emotional understanding of maltreated young children is consistent (Pears & Fisher 2005), if slightly reduced, when IQ and socioeconomic status are controlled for (Smith & Walden 1999). Understanding sad and angry emotions at age six predicts social competence and social isolation at eight (Rogosch *et al.* 1995).

In addition to problems of emotional understanding, there have also been reports of delayed theory of mind understanding in maltreated children (Cicchetti *et al.* 2003; Pears & Fisher 2005). The capacity to parse complex and emotionally charged representations of the parent and of the self might even deteriorate with development (Toth *et al.* 2000).

Considered in relation to attachment, mentalisation deficits associated with childhood maltreatment may be a form of decoupling, inhibition, or even a phobic reaction to mentalising.

1 Adversity may undermine cognitive development in general (Cicchetti *et al.* 2000; Crandell & Hobson 1999).
2 Mentalisation problems may reflect arousal problems associated with exposure to chronic stress (see Cicchetti & Walker 2001).
3 The child may avoid mentalisation to avoid perceiving the abuser's frankly hostile and malevolent thoughts and feelings about him/her (e.g. Fonagy 1991).

These are all potential problems that will have a significant negative impact on a child's psychological, emotional, social and educational development.

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 might be told that he or she 'deserves', 'wants', or even 'enjoys' the abuse). This is more likely to 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 invalidate the child's communications with the parents about his/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/mentalise 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.

The speculations above 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 borderline personality disorder (BPD) tend to see the unstable, non-nurturing family environment as the key social mediator of abuse (Bradley *et al.* 2005), while under-involvement is the best predictor of suicide (Johnson *et al.* 2002) and personality dysfunction (Zweig-Frank & Paris 1991).

We have argued that insecure and unpredictable attachment relationships between parent and infant may create an adverse social environment that limits the infant's opportunity to acquire 'mind-reading'. But why should evolution allow for such variation if mentalising is such a valuable adaptive capacity? In social environments where resources are limited, non-mentalising might be adaptive. The parent's lack of mirroring behaviour might serve as a signal for limited resources, warning the child that he/she will need to use physical force (even interpersonal violence) to survive. Violence is incompatible with mentalisation (Fonagy 2003b, 2003c). If violence rather than collaboration is required to survive, and violence is possible only when we avoid contemplating the mental state of the victim, then the child's lack of mentalising capacity could increase his/her chances of survival. By contrast, in resource-rich environments, adult carer-teachers are in a better position to facilitate the child's access to subjectivity. If parent–child interaction lacks marking, contingency, and other ostensive cues, mentalisation will be less firmly established and more readily abandoned under emotional stress. The child may then manifest early aggression and conduct problems (Lyons-Ruth 1996). From the point of view of appropriate intervention, it is probably more helpful to view this kind of aggression as an understandable adaptation rather than demonising it as an incomprehensible genetic aberration, even if these behaviours are primed in some individuals by a very sizeable genetic component (e.g. Silberg *et al.* 2007).

Attachment and the development of personality disorders

One of the areas where attachment is being particularly applied is in our understanding and treatment of PDs (Aaronson *et al.* 2006; Adshead & Sarkar 2012; Bakermans-Kranenburg & Van IJzendoorn 2009; Brennan *et al.* 1998).

PDs are defined as enduring behaviours that have an intrapersonal component (dysregulation of arousal, impulse and affect), an interpersonal component (dysfunctional relationship patterns), and a social component (which creates conflicts with others and with social institutions) (Adshead & Sarkar 2012) and has significant implications for an adult's capacity for managing in society and as a parent. Attachment theory accounts for these four characteristics of PDs (Westen *et al.* 2006) and provides an ideal standpoint from which to understand these disorders.

Good-quality interactions with early caregivers are the critical element in the development of secure attachment. In turn, secure emotional attachment is crucial

for the development of a healthy personality (Braun & Bock 2011). It is thus unsurprising that there is a high prevalence of childhood trauma in both insecurely attached individuals and patients with PDs (Bakermans-Kranenburg & Van IJzendoorn 2009; Buchheim *et al.* 2008; Gabbard 2005; Lyons-Ruth *et al.* 2005; Riggs *et al.* 2007; Teicher *et al.* 2002). Further childhood trauma is strongly correlated with an incoherent/disorganised adult attachment style more than just to the general category of attachment insecurity (Barone 2003; Westen *et al.* 2006).

Among individuals with PDs, rates of childhood trauma are high (73% report abuse, of which 34% is sexual abuse, and 82% report neglect). Compared with healthy adults, PD patients 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; Bennett 2005; Johnson *et al.* 1999).

BPD is more consistently associated with childhood abuse and neglect than other PD diagnoses (Baird *et al.* 2005; Battle *et al.* 2004; Buchheim *et al.* 2008; Fonagy & Bateman 2008; Fonagy *et al.* 2003; Johnson *et al.* 1999; Teicher *et al.* 2002). Obsessive-compulsive PD has been associated with sexual abuse by non-caretakers (Battle *et al.* 2004). However, not all people who have suffered childhood trauma develop adult psychopathology. The effects of trauma are mediated by attachment (Riggs *et al.* 2007) 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). Likewise, female victims of childhood trauma are more likely to develop somatisation symptoms if they are fearfully attached (Waldinger *et al.* 2006). If traumatic events provoke an activation of the attachment system, then individuals who tend to respond to these experiences through the inhibition of mentalising function and emotional regulation are less likely to resolve these events, and more likely to manifest personality pathology later in life (Bateman & Fonagy 2012).

An environment in which a child experiences insecure and unpredictable attachment relations might be expected to disrupt the acquisition of robust mentalisation or 'mind-reading'. However, within the contexts of deprivation and risk, mentalisation could hold the key to breaking the cycle of abuse and deprivation for that child growing up, and for the children he/she later has. BPD is characterised by the holding of schematic, extreme views and the display of powerful emotions and impulsive behaviour. According to our theory, this can be seen as a failure, or breakdown, of mentalising, brought about by overpowering emotional arousal, the activation of attachment needs, or by a strong impulse to deflect attention away from threat or hostility as a consequence of severe maltreatment. There are, therefore, significant clinical implications of this mentalisation-based approach to BPD; helping to improve the capacity to mentalise, particularly in relation to traumatic experiences, enables the individual to resist

difficulties in affect regulation and the pull back toward modes of primitive mental functioning.

Conclusions

Secure attachment is the firm expectation of distress being 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 we experience thoughts, including attachment-related thoughts and the cognitive structures that underpin these, may be seen as linked to physical aspects of early infantile experience. Attachment immediately takes centre stage once we recognise the physical origins of thought. We now see insecure patterns of attachment as adaptations that maximise 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.

Bowlby was right that it is not hunger and nurturance that provide the evolutionary key. The drive for the process of bonding is the experience of the infant's body (his/her movements) as allowing him/her to control the caregiver's responses (Watson 2001). This is primarily a physical, sensory-motor experience. In this sense attachment theory may be closer in spirit to the emerging neuroscience approach of embodied cognition than it is to traditional cognitive psychology.

Missing out on early attachment experience (as was the case for the Romanian orphans) creates a long-term vulnerability from which the child might never recover – the capacity for mentalisation is never fully established, leaving the child vulnerable to later trauma and unable to cope fully with attachment relationships (e.g. Rutter & O'Connor 2004). More importantly, by activating attachment, trauma will often decouple the capacity for mentalisation. This, of course, is further exacerbated when the trauma is attachment trauma. The capacity for mentalisation in the context of attachment is likely to be in certain respects independent of the capacity to mentalise about interpersonal experiences outside the attachment context (Fonagy & Target 1997).

Changes in cognitive science call for at least a partial review of some attachment ideas, seeing the brain as more continuous with the mind and seeing the mind as ever reflecting its bodily origin. We are increasingly aware that the brain is the organ of the mind and disorders of the mind are also disorders of the brain. We see that attachment relationships have a unique brain representation, and empathy or sensitivity depend on the effective functioning of specific brain centres. Considerable evidence is accumulating that disorders of the capacity to form relationships with one's infants or in adulthood can be characterised 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 the cognitive science of the 1970s. Cognitive neuroscience, psychoanalysis, and new attachment theory

can come together in the foregrounding of feeling and the confluence of thought, bodily states and action. Attachment has been selected by evolution as the principal 'training ground' for the acquisition of mentalisation. It is the evolutionary instrument for humanity's most defining feature: the capacity for a rich social understanding that makes use of a wide range of intentional states, and which can seek to fathom both our self and others.

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