
Attachment and Theory of Mind: Overlapping Constructs?

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Introduction

In the past few years there has been a shift of interest in research on the developmental course of the child's understanding of mind. Increasingly, contributors to this field are focusing on the ontogenesis of the child's 'theory of mind' (Premack & Woodruff, 1978), and on elaborating theories of the origin and development of the child's capacity to conceive of mental states in himself and others (see Lewis & Mitchell, 1994 or Carruthers & Smith, 1996, for a review of current perspectives). Empirical work focusing on the factors that influence the acquisition of 'a theory of mind' is still relatively sparse.

Bridging the divide between cognitive and social development

It is self-evident that the child's cognitive development takes place not alongside but within the emotional turmoil normally generated by family and peer relationships. It should be equally obvious that the child's growing cognitive capacities will materially affect the nature of his/her relationships with those around them. Yet developmental researchers, for the most part persist with the delusion that the child is a 'solitary thinker', that affect is more conveniently regarded as the consequence rather than cause of thought, and that the child's behaviour may be meaningfully sampled in experimental tasks without consideration of the nature of the relationship between child and tester and the representation (or meaning) of that relationship to the child. My aim here is to make a further tentative step towards bridging these two traditions of developmental research.

I have never been convinced that 'mindreading' suddenly emerges at the age of three or four independent of the child's social relationships. Recent work on the precursors of a theory of mind by, for example Baron-Cohen, Charman and colleagues underscored my suspicion (Baron-Cohen, 1991, 1993, 1994; Baron-Cohen et al., 1996). Too much happens between the infant-toddler and the caregiver which is hard to account for unless we assume a primitive ability on the part of the child to adjust his/her actions in the light of the assumed mental states of others.

When my son was less than 2 years old he loved being read Spot playing hide and seek. As I learned the story fairly well after the first dozen or so readings it was a relatively easy task to paraphrase the story introducing more mental state constructs, for example: 'Spot is wondering if somebody might be under the stairs. Do you think Spot is thinking if he opens the door he will find out? Oh look there is the crocodile!' Actually, I did these modifications quite unconsciously, just to raise my popularity ratings. When I replaced these elaborations with non-mentalistic expansions, such as 'Look at the door, it looks really heavy' or 'the crocodile has big teeth and is ever so green' etc my son's non-verbal behaviour left no doubt in my mind that he preferred the mentalizing expansions. He appreciated the difference. We must all have experiences like this with children and I am convinced that in the way we tease them or are teased by them or share in their pretend world, or are taken in by their attempts at deception, we consistently assume that they possess a rudimentary representation of their own and our

1. The term 'theory of mind' is helpful in underscoring the predictive and hypothesis generating nature of the child's approach to mapping the opaque character of mental content in others (Brentano, 1924) but is unfortunate in so far as it focuses attention on the change in the child's view of minds other than his/her own. Yet one, arguably the most important, aspect of the developmental water-shed of the acquisition of the skills and conceptual knowledge necessary to become able to infer unobservable mental states is that the capacity to see others as thinking, feeling, believing and desiring, emerges in relation to the self concurrently with its emergence in relation to others (Gopnik, 1993). An alternative denotation proposed by Morton and Frith (1995), 'mentalization' seems to us preferable, although the former terminology is so well established that we are pessimistic about the possibility of change.

minds. I think this assumption is critical to how this capacity actually develops and flourishes between 33 and 40 months (Bartsch & Wellman, 1995).

The most consistent attempt at making such connections is represented by the inspiring programme of work by Judy Dunn and her co-workers (Dunn, 1988, 1994; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Dunn, Brown & Beardsall, 1991; Dunn & Brown, 1993). They have shown that the development of children's understanding of mental states is embedded within the social world of the family with its interactive network of complex and at times intensely emotionally charged relationships. Dunn, Brown, Slomkowski et al. (1991) for example, demonstrated that family interactions at 33 months, particularly the amount of control the mother exerted over the sibling and the child's attempt to co-operate with the sibling, correlated with these children's ability to use false beliefs in explaining behaviour at 40 months. Dunn, Brown and Beardsall (1991) demonstrated that performance on a perspective taking task at 6 years was predicted by the diversity of feelings, their causal content and the extent to which disputed feelings were discussed in families at 3 years. In a similar vein, Denham, Zoller and Couchoud (1994) showed that parental talk about emotions and their own affective responding to the child's emotions at 3-4 years predicted emotion understanding.

The importance of Dunn's programme of work is highlighted by recent findings that the rate of acquisition of the capacity to appreciate false beliefs is significantly affected by family size. Perner, Ruffman and Leekam (1994) demonstrated that 3-4 year old children with siblings were more likely to predict a story character's mistaken (false-belief based) action. Jenkins and Astington (in press), following the suggestion from Perner et al.'s results, reanalysed their comparable data set and were able to demonstrate that the presence of siblings facilitates the acquisition of a 'theory of mind' and that this effect is independent of the benefit siblings might have on the child's verbal fluency. The potential causal significance of this finding is strengthened by Brown and Dunn's (1992) observation that 4 year olds spend more time discussing feelings and discuss a wider range of feelings with their siblings than they do with their mothers.

Harris (1994), in his review of current research on the child's understanding of emotion, suggested that family discussion of emotion may attune children

to the way that individuals differ in their emotional reactions to similar situations or that emotional reactions may change over time, and that this happens in ways that alert the children to the representational processes (thoughts, beliefs, desires) that underpin emotion-related behaviour.

Thus, evidence is accumulating for Dunn's (1994) suggestion that the nature of the child's interactions with people intimately involved with them during the time when understanding of minds emerges may give important insights into the nature of the conceptual structure children are acquiring as part of their theory of mind, and the origin of and driving forces behind this process of acquisition. The work of Perner et al. and Dunn and colleagues suggests that the study of individual differences in performance on tasks requiring an understanding of false beliefs might be a good way to gather more knowledge about the factors involved in the acquisition of a 'theory of mind'.

Attachment and social cognitions

The notion that the 'harmoniousness of the mother-child relationship contributes to the emergence of symbolic thought' (Bretherton, Bates, Benigni, Camaioni, & Volterra, 1979, p.224) is by no means a new concept (Baldwin, 1906; Mead, 1934; Vygotsky, 1978; Werner & Kaplan, 1963). More recently, Bruner (1975) suggested that the child constructs a knowledge of language and linguistic forms through joint action and joint reference with the mother. Attachment theorists have strongly endorsed such notions. For example, Marvin and Greenberg (1982) proposed that 'it is likely that the first relationships within which children develop this skill [the tendency to respond not only to another person's behaviour but also to his or her conception of others' attitudes, intentions, or plans] are with their attachment figures' (p.48).

The infant's behaviour is intentional, purposeful, goal directed, and apparently based on specific expectations (Bowlby, 1973). The evolution of these expectations about the availability and responsiveness of the caregiver lies at the core of attachment theory. The infant's reactions to new situations occur in the light of past experience, biasing his responses to the caregiver in the light of these expectations. Bowlby (1973) referred to the organisation of these expectations of the caregiver and self in the relationship as an 'internal working model'. As early as 1969 Bowlby clearly recognized the significance of

the developmental step entailed in the emergence of 'the child's capacity both to conceive of his mother as having her own goals and interests separate from his own and to take them into account' (Bowlby, 1969, p.368).

Bretherton (1985) was perhaps the first explicitly to link attachment theory and research on the acquisition of a 'theory of mind'. Bretherton (1990) argued that insecurely attached infants are likely to devote attentional resources to monitoring the emotional and physical availability of the parent, while securely attached infants are able to devote more attention to exploration and, by inference, to experiences likely to advance the developing structures of the mind. Main (1991), in a hallmark chapter on attachment and metacognition, was the first to propose that the 'epistemic space' available to securely attached children in which to reflect on and review actions and thinking processes is likely to be greater compared to insecurely attached ones. She reported pilot studies by Kaplan (1987) with 6 year olds which found, in a post hoc analysis, more 'spontaneous metacognitive remarks' in securely attached children than insecurely attached ones. In fact, the adult attachment classification, proposed by Main, Kaplan and Cassidy (1985), is explicitly coded for the presence of metacognitive mental processes as indicators of a secure internal working model.

The operationalization of these processes was refined by Fonagy, Steele, Moran, Steele and Higgitt (1991) in a study of the predictive value of prenatally collected Adult Attachment Interview (AAI) protocols for infant attachment. The frequency of both prospective mothers' and fathers' references to mental states in their accounts of their own childhood attachment experiences predicted the likelihood of their children being securely attached to them, even when verbal IQ was controlled for. More recently Moss, Parent and Gosselin (1995) found that concurrent assessments of attachment security with mother was a good predictor of metacognitive capacity in the child in the domains of comprehension, memory and communication. In a pilot investigation, Fonagy, Redfern and Charman (in press) found that security of attachment, as measured by the Separation Anxiety Test (SAT), was a significant predictor of theory of mind competence, as measured by a belief-desire reasoning task, in 3½ to 6 year old children when age, verbal mental age and social maturity were all controlled for.

These studies, being mostly cross-sectional in

design, leave several important questions unanswered. Firstly, we do not know whether security of attachment at preschool age is a correlate of metacognitive (mentalizing) capacity because it is an indicator of patterns of attachment in infancy or because its measurement at the preschool age (particularly using the SAT) overlaps with the assessment of false-belief reasoning. Secondly, we do not know whether attachment to mothers and fathers contribute equally to the development of theory of mind or whether the primacy of the maternal caregiver is evident in this domain. Thirdly, we are uncertain whether the attachment security of the caregiver, which is related to metacognitive (mentalizing) capacity, has an effect on theory of mind development and, should such an effect exist, whether this is mediated by the child's attachment security with either parent. Fourthly, given the variety of tasks available to assess theory of mind, we do not know whether all are equally and similarly affected by attachment status, or whether understanding mental states linked to emotions have a closer connection to attachment status than do tasks that require reasoning about beliefs alone.

In the UCL-AFC parent child project, initiated by Miriam Steele almost 10 years ago, we obtained AAI interviews from both parents before the birth of their first child and reported strong associations with Strange Situation classification of the infant with mother (1 year) and father (18 months) (Fonagy, Steele, & Steele, 1991; Steele, Steele, & Fonagy, 1996). This sample provided an ideal testing ground for exploring the relationship between quality of attachment and mindreading performance. The sample was followed up at 5½; and amongst many other assessments we administered three theory of mind measures: 1) the standard false-belief task (Wimmer & Perner, 1983); 2) the second-order belief attributions task adapted from Perner and Wimmer (1985) and Baron-Cohen (1989) which tests children's capacity to think about another person's thoughts about a third person's thoughts about an objective event. (Where will John look for Mary who has gone to get ice cream, when he knows that the ice cream van has moved but he (falsely) believes that she does not?); 3) the cognitive-emotion task, adapted from Harris (1989), which assesses if the child is able to predict a character's emotion (rather than action) on the basis of the character's false belief. The task tests the child's understanding that emotional reactions are contingent not on what actually happens but on what

people expect to happen. (Will Ellie the elephant be excited by the thought of drinking his favourite drink even though the child [but not Ellie] knows that the drink is already gone?).

Ninety-two children from the original cohort of 100 were seen at 5 years of age. Only five subjects were not seen from the sample tested at 12 months, attrition was less than 5%. Seventy percent of the subjects passed the cognitive-emotion task and 26% passed the second order belief attribution task. Unfortunately, only two subjects failed the false-belief task. There was a relationship between performance on the cognitive-emotion task and verbal fluency. Verbal fluency was assessed using a test frequently used by speech specialists as a screening test for children with difficulties of verbal comprehension or expression. It correlated with the cognitive-emotion task better than IQ and accounted for almost all of the common variance between mental age and theory of mind task performance. However, neither measure correlated strongly with the second order task.

Secure classification in infancy with mother predicted success in the cognitive-emotion task. Sixty-four percent of those classified as secure at 12 months passed the task at 5½ years, whereas 67% of those classified as insecure failed. Interestingly, it was infants classified as avoidant or resistant who were particularly likely to fail. Those classified as disorganized were as likely to pass as secure children. In a hierarchical logistic regression, expressive language at 5½ and secure classification with mother at 12 months proved to be significant predictors.

Infant-father attachment also predicted the child's performance, with 77% of infants classified as secure passing the test. However, in this case, expressive language accounted for at least some of this association. In the hierarchical logistic regression infant-father security was no longer a significant predictor once expressive language was included in the regression. There was some indication of an additive relationship, in that 83% of children whose mother and father attachments were both secure passed the task. By contrast, only 60% of those with one secure relationship passed the task, and 49% of those with two insecure attachments did so. A similar but somewhat weaker pattern could be observed with the second-order task. Thirty-six percent of those secure with both parents passed compared with 23% who were secure with one, and 9% who were insecure with both.

There were other findings consistent with the proposition that children secure in infancy are at an advantage in mind reading tasks. For example, in their performance on a narrative task involving a completion of conflict-arousing stories, children who had been secure with both parents had significantly lower antisocial scores, bringing fewer themes of jealousy, non-sharing, aggression, taunting and refusing empathy. Children who had been secure with both parents were more likely to bring themes associated with discipline and limit-setting, such as compliance, shame, verbal but not physical punishment, and time out. Thus, overall, children with experiences in infancy marked by security not only performed better at theory of mind tasks, but in tasks which may be thought to reflect a predisposition to a greater psychological awareness of the other, in terms of empathy, sharing and affiliation and, in the case of wrongdoing, guilt and reparation.

Discussion

So what mechanisms may be conceptualized to account for these results? There are three possible classes of models that we might consider.

The relationship between infant attachment and theory of mind performance may be spurious due to a third variable such as temperament, or some other genetic constitutional construct. We feel relatively confident that temperament is not a significant component of this association, given that two relatively independent relationships, that with the mother and that with the father, independently predicted theory of mind performance, at least for the cognitive-emotion task. We even explored the possibility that children securely attached to mother were more likely to have siblings which might have enhanced their performance. Not surprisingly this turned out not to be the case. The findings are also strengthened by their robustness to IQ and verbal competence, particularly as the latter are known outcomes of secure early relationships as well as being genetically determined to some degree (Bretherton, 1990). If we assume that the findings are not spurious there are two possibilities left open that I would like to consider in detail. One class of models would suggest that security in infancy predisposes children to benefit from certain social processes which may be directly involved in the development of social understanding. The alternative to such a mediational model would be that secure attachment in itself is an indicator of a relationship between the infant and caregivers that

generates psychological understanding. Thus in these models the social processes which give rise to mind reading are the very same as those which facilitate secure attachment. If this was so, mind reading and secure attachment may well be considered overlapping characteristics of both the child and his social relationship.

Let me consider some mediational models first. This class of model requires two components:

- Evidence that certain social processes may be involved in the development of social understanding;
- That these social processes are more likely to be found in children securely attached to their caregiver.

There are at least three possible mediational models.

The role of pretending

Children who, in their third year, are better able to engage in co-operative interaction (Dunn, Brown, Slomkowski et al., 1991) and particularly joint pretend play (Astington & Jenkins, 1995; Taylor, Gerow, & Carlson, 1993; Youngblade & Dunn, 1995), do better on assessments of mind reading and emotion understanding. There are independent data from the Minnesota Longitudinal Study to suggest that children who are securely attached in infancy, when observed at age 4½ years, manifest stronger engagement in fantasy play, while avoidant children show impoverished themes and low level of engagement (Rosenberg, 1984, cited in Carlson & Sroufe, 1995). Similar observations were reported by Main and her colleagues (Main et al., 1985). It is possible that the experience of sharing a world of pretend may foster an understanding of the mental states of others and that this capacity is in turn facilitated by secure attachments in infancy. Children with a secure attachment history are more likely to engage in activities which involve sharing their mental world and thus encounter experiences which teach them about how the mind works.

Talking about people

Dunn and her research group have also provided us with evidence that engaging in conversations about feelings and the reasons behind people's actions was linked to the relatively early achievement of mind reading (Dunn, Brown & Beardsall, 1991; Dunn & Brown, 1993; Brown, Donelan-McCall, & Dunn, 1996). Experimental studies reported by Appleton and Reddy (1996) demonstrated that conversational

opportunities concerning mental states improved children's mind reading performance. Strage and Main (1984, cited in Carlson & Sroufe, 1995) reported that discourse patterns between mothers and children at age 6 could be predicted from early attachment classifications with dyads classified as secure being more fluent and discussing a wider range of topics, whereas those classified as avoidant emphasized topics showing little topic elaboration. Dunn's work indicates that not all conversations are equally helpful in facilitating mind reading; mothers' explanations of behaviour are facilitative only if they occur in the context of shared play, comforting or joking. This matches the pattern of interaction observed amongst secure dyads (Strage & Main, 1984). Thus we may suggest that such dyads are more likely to create patterns of narration that support thinking about feelings and intentions which lie at the root of theories of mind. The fact that predominantly such narrations concern emotionally charged matters (Dunn, 1996) is consistent with the greater ease with which secure children have repeatedly been observed to deal with emotional issues in an open and free way (Cassidy, 1988; Bretherton, Ridgeway, & Cassidy, 1990; Main et al., 1985).

Peer group interaction

The third potential mediator of the association of attachment to mind reading is the quality of interaction with peers. We have already noted that the possibility of interaction with siblings is likely to enhance theory of mind performance (Perner et al., 1994; Lewis, Freeman, Kyriakidou, & Maridaki-Kossotaki, 1995). Dunn and her co-workers demonstrated that children are more likely to talk about mental states with siblings or friends than with their mothers (Brown et al., 1996) and their use of mental state terms with friends predicts best performance on false-belief tasks. There is an independent substantial body of information that supports the link between secure attachment in infancy and ratings of peer competence. In the Minnesota Study (Elicker, Englund, & Sroufe, 1992) children's infant pattern of attachment predicted social competence as late as pre-adolescence. In sociometric ratings, direct observations and teachers' reports, children with secure attachment histories appeared to form deeper relationships with individual partners (Pancake, 1985; Sroufe, 1983), were more capable of reciprocity, were more socially oriented, popular, and empathic (Kestenbaum, Farber, & Sroufe, 1989). This pattern of findings has been replicated in

several other studies (Lieberman, 1977; Park & Waters, 1989; Suess, Grossmann, & Sroufe, 1992). Thus, securely attached children are more likely to engage in the kind of playful, co-operative interactions with their peers that we expect will facilitate learning about minds.

Bringing the models together

There is nothing exclusive about these models. In general, they suggest a greater propensity for social engagement relevant to the development of social understanding amongst securely attached young children. In fact, the evidence from Dunn's work suggests that these different contexts correlate poorly with one another. For example, observational data indicate that individual differences found in pretend play, management of conflict and discourse about mental states, are not correlated between social situations (mothers, siblings, close friend) although each correlates with socio-cognitive assessments (Brown et al., 1996; Slomkowski & Dunn, 1992; Youngblade & Dunn, 1995). The fact that children's behaviour correlates poorly across social partners and situations, although each of those situations relates to test performance, could suggest that there are a number of simultaneously operating pathways between attachment and social situations.

Alternatively, it is possible that the variables that *prima facie* may be considered to be mediating the attachment-mind reading relationship are not on the causal path at all, that their correlation with the rate of acquisition of mind reading is spurious, and that the causal sequence of the relationship does not involve these social experiences but is directly related to the child's attachment status. Here we suggest that the early experience with the primary caregiver in the first year of life creates the bedrock of theory of mind competence. What evidence do we have to support such a contention? First, it is important to note that a mother's attachment classification before the birth of the child is a powerful predictor of the child's theory of mind competence at 5 years. Seventy-five percent of children of secure, autonomous mothers passed the cognitive-emotion task, while only 16% of children of preoccupied mothers and 25% of those of unresolved mothers did so. This relationship holds even if expressive language is controlled for. This suggests that the caregiver brings something to the parent-child relationship, evident soon after the birth of the child, that may be critical in the child's establishment of both secure attachment and mind reading.

What is the nature of this competence? We have already touched on how the caregiver's capacity to envisage the mental states of their own parents is predictive of the infant security of attachment to each of the caregivers. Ratings on this scale were found to predict the child's performance on cognitive-emotion tasks for both mother and for father. Even more important, mother's capacity to reflect on her own childhood in the Adult Attachment Interview shared that portion of the variance with the child's theory of mind performance which was predicted by the quality of mother-infant attachment. In a more complex path analysis, we found that mother's mentalizing ability had a direct as well as an indirect relationship with the child's theory of mind. Thus, the child's attachment security was not the only predictor. The mother's capacity to envisage the child as a mental entity also proved to be important.

Implications

I will only touch briefly on some of the implications that follow from these findings. It is our belief that the caregiver's capacity to observe the moment to moment changes in the child's mental state is critical in the development of mentalizing capacity. The caregiver's perception of the child as an intentional being lies at the root of sensitive caregiving, which is viewed by attachment theorists to be the cornerstone of secure attachment (Ainsworth, Blehar, Waters, & Wall, 1978; Bates, Maslin, & Frankel, 1985; Belsky & Isabella, 1988; Egeland & Farber, 1984; Grossmann, Grossmann, Spangler, Suess, & Unzer, 1985; Isabella, 1993; Isabella & Belsky, 1991). Secure attachment in its turn provides the psychosocial basis for acquiring an understanding of mind. The secure infant feels safe in thinking about the mental state of the caregiver and is thus more readily able to construct a mentalized account of the caregiver's behaviour. What I believe is far more important for the development of mentalizing capacity is that exploration of the mental state of the sensitive caregiver enables the child to find in the caregiver's mind an image of himself as motivated by beliefs, feelings and intentions, in other words, as mentalizing. There is considerable evidence to support the view that secure attachment enhances the development of the self, inner security, feeling of self worth, self reliance and personal power of the emerging self as well as the development of autonomy (Bates et al., 1985; Gove, 1983, in Carlson & Sroufe, 1995; Londerville & Main, 1981; Matas, Arend, & Sroufe, 1978).

Clinical implications

The model of the development of mentalizing capacity that we propose has considerable clinical implications. Maltreated children, perhaps even more than insecure ones, are at risk of failing to find their own intentional being within the mind of the caregiver and thus are at risk of serious deficit in this important psychological domain. Beeghly and Cicchetti (1994) demonstrated that maltreated 3 year olds manifest a specific language deficit in their use of mental state language. Our own work with severely personality-disordered patients has demonstrated that individuals with a history of maltreatment who appear to react to these experiences by a dramatic reduction in their consideration of mental state constructs are far more likely to manifest borderline psychopathology than individuals with the same degree of maltreatment history but who maintain the capacity to mentalize (Fonagy et al., 1996).

Not surprisingly, in a group of prisoners the capacity to reflect on mental states is even more scarce than in a sample of patients matched for psychiatric diagnoses (Levinson & Fonagy, submitted). We would argue that crime comes more easily as a means of social adaptation to individuals whose early experience has led them to turn away from the mental states of others. In line with this was our observation that violent criminals were more likely to manifest severe deficits in reflective functioning. These views have a further implication for the therapeutic process as a whole. We believe that the non-pragmatic, elaborative, mentalistic stance of psychotherapy forces the patient to focus on the mental state of a benevolent other, thus enhancing mentalizing capacity as well as offering an opportunity for the patient to find their own mentalizing self in the mind of the therapist. Regardless of the therapeutic stance, this will serve to enhance the patient's core self structure leading to desirable outcomes such as the encouragement of concern, the creation of whole person representations and meaningful and predictable experiences in relation to the understanding of the behaviour of others.

Mind reading may not be an unequivocally positive experience. Judy Dunn's work, however, gives us an indication that at least the understanding of emotion at age 3½ years predicts a positive perception of social relations, mature moral sensibility and the understanding of complex emotions (Herrera & Dunn, cited in Dunn, 1996).

Whether bonding creates the social situations that will encourage mind reading, or whether secure attachment is that social situation, perhaps matters less than the better understanding of the nature of early experience that can predictably lead to desired social outcomes. I believe that the systematic facilitation of the development of the children's awareness of the mental states of those around them is an important target for preventive intervention in social and behavioural disorders in children as well as personality disturbance and antisocial behaviour in adolescence and adult life. I believe the task is clear, and the experimental work now needs to be performed.

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