Infants' minds, mothers' minds, and other minds: How individual differences in caregivers affect the co-construction of mind

Elizabeth Meins

Psychology Department, University of Durham, Science Laboratories, South Road, Durham DH1 3LE, United Kingdom. **elizabeth.meins@durham.ac.uk**

Abstract: Carpendale & Lewis's (C&L's) constructivist account needs greater emphasis on how individual differences in caregivers' impact on the efficacy of epistemic triangle interaction in fostering children's understanding of mind. Caregivers' attunement to their infants' mental states and their willingness to enable infants to participate in exchanges about the mind are posited as important determinants of effective epistemic triangle interaction.

Carpendale & Lewis (C&L) argue that children are active participants in acquiring mentalising abilities, constructing an understanding of mind during social interaction within the epistemic triangle. Their account represents an advance on individualistic and enculturation approaches to theory of mind (ToM) development, but would benefit from a greater consideration of how individual differences in caregivers influence the efficacy of interaction in the epistemic triangle in fostering an understanding of mind. In order for children to benefit most from social interaction in constructing a ToM, the interlocutor should be sensitive to and cognisant of the child's current state of mind. For example, in one of our longitudinal studies on the social determinants of ToM performance, we found that mothers' use of mental state language that commented appropriately on their 6-month-olds' putative mental states was an independent predictor of children's ToM performance at age 4 (Meins et al. 2002). In contrast, indices of the general quality of the mother-infant relationship (maternal sensitivity and attachment security) did not predict children's subsequent ToM.

What is perhaps most interesting about this study's findings is that ToM performance was related to only certain kinds of early mental state language, and not to exposure to mental state talk in general. Mothers' use of mental state language that appeared inappropriate to the infant's current mental state, indicating that they were misreading their infants' minds, was unrelated to later ToM understanding. Hence, although C&L claim that their "approach to the development of children's social understanding focuses on the *relations* between people" (sect. 2.1, para. 8, emphasis in original), they need to move beyond the assumption that the same form of relationship (e.g., mother-infant, child-sibling) will result in the same form of interaction. At present, C&L provide a detailed description of prerequisites required by the child to engage in constructive interaction in the epistemic triangle (e.g., joint attention skills, a certain level of linguistic competence), but individual differences in caregivers are not considered. Their account therefore places too much burden on the child's attributes in explaining individual differences in ToM understanding. Indeed, C&L need to consider the possibility that the child's attributes may initially be rather unimportant beyond giving the caregiver an indication of basic competence.

There is also the issue of timescale. In setting up the epistemic triangle as the context in which children construct an understanding of mind, the authors focus exclusively on infancy. Yet, they seek to use their account to explain social influences on ToM that come into play much later in development (sect. 4.2). For example, the facilitative effects of sibling (Dunn et al. 1991b) and peer (Brown et al. 1996) interactions have been found only in the preschool period, and the sorts of parenting style found to relate to ToM performance (Ruffman et al. 1999) would appear to be applicable only to children beyond infancy. Preschool children's social interactions involve complex abilities, such as pretense, with perhaps several playmates, whereas the classic epistemic triangle interaction involves a much more pared-down form of triadic exchange. It therefore seems that in focusing on preschool influences, C&L are trying to explain the "wrong" evidence. If epistemic triangle interaction is the means by which children construct a ToM, the authors need to concentrate more clearly on social-environmental factors that act during an earlier period of development.

Of course, this is a difficult task, because very little long-term longitudinal research on the social determinants of ToM exists. C&L mention one early social factor that has been linked to ToM (attachment security), but they need a much more thorough critical appraisal of how such differences in attachment are related to the child's active construction of mind. For example, no author has proposed a direct link between attachment security and children's ToM. Rather, certain precursors of attachment security, such as maternal mind-mindedness (Lundy 2003; Meins et al. 2001) or mothers' internal working models of attachment relationships (Fonagy et al. 1991), are likely to be at the root of any observed security-related differences in ToM. The epistemic triangle is an ideal context for highlighting how caregiver attributes – their mind-mindedness, their willingness to interpret their infants' behaviours as having intention, their representations of their own childhood experiences – are brought to bear on what they say to their infants and how they manage early dyadic and triadic interactions. Such a focus would also enable C&L to discuss in greater detail how atypical development (e.g., deafness, autism) may affect the caregiver's ability to interact within the epistemic triangle, and thus, children's ToM development.

In order for the constructivist account to explain how the social environment influences ToM, it needs to address how the attributes of the caregiver work in concert with those of the infant to provide early interactions that will foster the child's understanding of mind. Such interactions need to do more than merely ensure that the child is exposed to mental state language. It is likely that our finding that mothers' mind-related language at 6 months predicts later ToM performance is due in part to the fact that such language is one facet of a broader picture of general attunement between mother and infant (e.g., Lundy 2003). An insufficient attention to the child- and caregiver-centred determinants of this attunement means that C&L's account is in danger of suffering from the very failing that they complain about in traditional accounts of ToM development, namely, the lack of an "integrated system" within which social-environmental influences on ToM can be understood. A more careful emphasis on caregivers' attributes (as well as those of the child), and their willingness to allow children to participate in exchanges about the mind, would provide the authors' account with precisely such integration with the wider context of social-cognitive development.

Structure, genesis, and criteria

Carol A. Miller[a] and Ulrich Müller[b]

[a]*Department of Communication Sciences and Disorders, Pennsylvania State University, University Park, PA 16802;* [b]*Department of Psychology, Pennsylvania State University, University Park, PA 16802.*
cam47@psu.edu   umueller@psu.edu

Abstract: We agree that social interaction is crucial for understanding the development of theory of mind, but suggest that further elaboration of certain issues is needed. Detailed description of the knowledge structure of a developing theory of mind is necessary, and the notion of criteria for the use of mental state terms requires consideration of the sentence structures in which such terms appear.

Carpendale & Lewis (C&L) make a timely contribution to current debates regarding the development of theory of mind. C&L's emphasis on the gradual development of theory of mind in the context of interactions between child, other, and object provides a much-needed balance to the extremes of current accounts of theory of mind development, which focus narrowly on processes

within the individual, or the cultural construction of psychological states, and ignore the interface between individual and culture. However, we contend that C&L's approach needs to be extended and made more precise in order to fulfill its explanatory potential. Two issues in particular are in need of elaboration: The first issue pertains to the relation between structure and genesis, and the second to the concept of criteria.

C&L provide a genetic account of the development of social understanding in general, and theory of mind in particular. Their proposal, however, lacks any detailed description of the knowledge structure that characterizes different levels of social understanding. They briefly allude to three features that are required for the acquisition of a theory of mind: (1) the assumption of a stable, external world; (2) the importance of the realization that there is access to information through seeing; and (3) attentional capacity. None of these features, however, clarifies how understanding of, say, false beliefs differs from understanding of, say, the concept of seeing, or why the former is acquired at a later age than the latter. To the extent that C&L focus on the developmental mechanisms that lead to the acquisition of a theory of mind, their proposal is, in fact, compatible with a number of proposals that focus more on the knowledge structure involved in theory of mind. Other proposals have tied this knowledge structure to metarepresentation (Perner 1991), confronting of perspectives (Perner et al. 2002), the embedding of if-if-then rules (Zelazo & Frye 1997), working memory (Gordon & Olson 1998), inhibition (Carlson & Moses 2001), and mastery of sentence complements (deVilliers & deVilliers 2000).

Without a more detailed description of what is involved in a theory of mind, the specific forms of social interaction that may promote or impede the development of a theory of mind (Turnbull & Carpendale 1999a) remain underspecified. It is possible that different aspects of social interaction contribute to different aspects of the knowledge structure characteristic of theory of mind. For example, whereas the coordination of conversational turns may promote the increase of working memory, contrastive utterances may facilitate perspective-taking (Sabbagh & Callanan 1998). The forging of closer links between social interactions and the development of a theory of mind requires detailed description of what is involved in the acquisition of a theory of mind. In fact, the close linkage of structure and genesis is one of the main theses of Piaget's theory (1967, p. 147): *"Genesis emanates from a structure and culminates in another structure"* (emphasis in original).

C&L suggest that mental state terms are learned by observing "the patterns of activity that are criterial for the use of such mental state terms – that is, the pattern of interaction for which we use these words" (sect. 3.2, last para.). Following Wittgenstein, they reject the notion that mental state terms point to inner objects. However, the same arguments against the view of words as correlated with things also apply to the view of words as correlated with events, that is, "patterns of activity." Lila Gleitman and colleagues have cogently presented the case that words are not simply mapped onto events in the world (Gillette et al. 1999; Gleitman 1990; Landau & Gleitman 1985). If a learner were to try to match a single word to its contingencies in the world, the possible hypotheses of the word's meaning are, if not infinite, certainly intractable, especially for verbs. Mental state terms would be particularly difficult to learn through word-to-world matching, as psychological states are not directly observable.

In other work, Carpendale argues that in order to understand the role of talk in the development of theory of mind, one must set aside the traditional "code model" of language (Turnbull & Carpendale 1999a). We would argue here that although "talk-as-interaction" is crucial to the development of theory of mind, the language code itself is also important and must be integrated into an overall account of social interaction and theory of mind. The structure of language is as important for learners as the way language is used.

Consider the verb *to think*. The number of "patterns of activ-

ity" that could reasonably occur in social interactions at about the time when an adult utters the word *think* is huge. What common elements could be extracted from those situations and taken to constitute the criteria for the use of *think*? Worse yet, thinking is going on all the time, yet talking about thinking is not. L. Gleitman and colleagues (e.g., Gillette et al. 1999) have suggested that the child can solve these difficulties by using, among other sources of information, the structure of the sentences in which mental state terms appear as a cue to their meanings. For instance, mental state terms and communication terms take propositions as arguments. By noting the range of sentence structures in which a verb appears, the child can gain crucial information about its meaning, for example, that mental states relate to propositions.

As C&L point out, "language, or communicative interaction, is the means through which children learn about other people's experience and so develop a more complete set of criteria" (sect. 3.2, para. 9). That set will not be complete unless it includes the sentence structures in which mental terms appear. We are very much in sympathy with C&L's approach to the study of theory of mind. We suggest that a first step in moving the approach forward is a more elaborated understanding of the relation between structure and genesis, and consideration of both the linguistic and nonlinguistic contexts in which mental state terms are used.

Being able to understand minds does not result from a conceptual shift

Peter Mitchell

School of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, United Kingdom. **peter.Mitchell@nottingham.ac.uk**
http://www.psychology.nottingham.ac.uk/staff/plm/home.html

Abstract: If anything, Carpendale & Lewis's (C&L's) target article could have gone even further in challenging the view that a radical conceptual shift equips children with a theory of mind. Also, the authors should have elaborated on why their social constructivist account is more plausible than nativism. Their argument against simulation theory is perhaps the least-developed part of their thesis, and does little service to their cause.

Carpendale & Lewis's (C&L's) thought-provoking target article offers a compelling account of the development of an understanding of the mind, and will be welcomed as a refreshing and attractive alternative to the rather ubiquitous "theory-theory" and modular accounts. On finding myself broadly in agreement with most of the views expressed in the article, I shall confine comments to matters of emphasis and the few areas of disagreement.

First, though, the most significant aspect of the article deserves to be highlighted. The authors provide a convincing argument on the gradual character of development in this important sphere of human functioning. On face value alone, it seems much more plausible than the popular claim from theory-theory that children undergo a singular radical conceptual shift. As Chandler and Hala (1994) persuasively argued, there are much more important and interesting changes that occur both before children begin passing a traditional test of false belief, and indeed afterwards. This brings into focus a detrimental consequence of theory-theory's dominating position as the mainstream account: Attention has concentrated so heavily on what happens at four years of age that it has effectively blinded many researchers to developments in understanding the mind that occur both before and after this time. If C&L stimulate attention to developments taking place at these other times, it will have done a great service. Indeed, they could have been even more ambitious and ventured further into the territory of development beyond the age of four years.

Another aspect of the article that needs to be highlighted is the much-welcomed critique of Wellman et al.'s (2001) claim to have discovered the truth about false belief. C&L correctly say that these authors set up a straw person as an alternative to their (Well-