Expanding perspectives: The interactive development of perspective-taking in early childhood

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Introduction
We propose an account of the child’s development of perspective-taking as a process of de-centring and expanding perspectives, in which the child gradually learns how its own and the other’s perspectives differ and are interrelated. This growing complexity in perspective-taking develops through interactions with the environment in general and with the main caregivers in particular. We take ‘perspective’ to mean the subjective access to the world, centred in the lived body and mediated by it. The novelty of our approach lies in the proposal that interaction is the ‘mechanism of change’.

In a way we offer an alternative account of the development of the capacities that Theory of Mind theory (ToM) aims to explain. ToM-theorists explain the possibility of second-person understanding out of the ability to implicitly or explicitly theorize on a social interaction from a third-person perspective (Bogdan, 1997; Hutto, 2004). Crudely put, the picture of social capacities that arises from ToM-theories resembles a game of battleship: a boardgame where two people try to localize each other’s hidden submarines. They do so by ‘dropping bombs’ on a coordinate system, at first randomly but gradually, depending on the ‘hits,’ more precisely. Likewise, we could say that on a ToM-story, one has to guess beneath the surface to infer the hidden mental states of the ‘opponent’.

Gallagher and others (Gallagher, 2001, 2008; Hutto, 2004) have extensively criticized this model of social cognition for being neither embodied nor interactive. Gallagher argues that the kinds of situations and capacities that ToM investigates concern only a small segment of our social lives. The explanation and prediction of another person’s behaviour in terms of their hidden mental states is something that we might occasionally engage in, but it is not the pervasive form of our social interactions. Rather than regarding primary and secondary intersubjectivity as pre-cursors to the real thing, Gallagher points out that these embodied interactions are
primary and pervasive, both developmentally and pragmatically. That is, these ways of understanding develop first and remain central throughout our lives.

In accordance with this viewpoint — that second-person embodied interactions are the pre-requisite for acquiring both a first- and third-person perspective — we propose that perspectives expand from pre-reflective to reflective through interactions.

Describing the child’s developmental process as one of de-centring and perspective-taking is a well-established approach. Introduced by Piaget (1928), and taken up by, for instance, Hobson (2002), we in turn want to highlight the embodied and interactive dimension of these processes in the social realm. Our proposal is in line with the enactivist account of social understanding as participatory sense-making (De Jaegher & Di Paolo, 2007; De Jaegher, 2009 a, b; Fuchs & De Jaegher, 2009). Here, we elaborate on the developmental side of this account.

In this paper, we have a twofold aim: firstly, we describe the child's social development in terms of expanding perspective-taking (sections I and III), and secondly, we criticize the narrow identification of social capacities with false belief understanding as is commonly done in the ToM tradition (section II).

I. Expanding familiarity with perspectives through interactions

We describe the development of some typical examples of what is generally considered social cognition. We do so in terms of a continuity that ranges from the personal perspective with which each human being comes into the world to the multi-layered, multi-aspect richness of human social interactions. We propose that this development consists in the growing complexity and differentiation of recognising and understanding one's own and others' perspectives. This expansion of perspectives does not happen in separated, clear-cut stages, but simultaneously and through mutual influence. Discovering one’s own perspective and that of others are processes that reciprocally constrain and enable each other.

Perspective expansion can be conceived both in terms of the interactions that children engage in as well as in terms of their growing awareness. Interactions become increasingly complex and can offer more and more possibilities for action and further interaction. Awareness begins focused and becomes more and more excentric and thereby enlarges its domain.

More in particular, we discuss a few kinds of interactions that play a role in the development of perspective-taking: the games of peek-a-boo and hide-and-seek (A), joint attention and pointing (B), and triangulation (C). Then we discuss the changing awareness of perspectives that characterises and accompanies these kinds of interactions: awareness of the other,

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1 We prefer not to use the term “social cognition” because it already entails a cognitive bias and connotes a modular approach to the development of social understanding.
awareness of the relation, and imagining the other's perspective as such (D).

Like we said, we do not consider these interactions nor the accompanying
cranges in awareness as clear-cut phases; they can rather be seen as
ments in the child's development, that take place in different periods and
with varying intensities. In other words, we highlight some important
ponents of what we consider to be the continuous theme in the child's
ocial development: the expansion of perspective-taking.

A. Peek-a-boo and hide-and-seek

As soon as infants are born, they engage in social interactions; they imitate
(Meltzoff & Moore, 1983), they regulate interactions through vocalizing and
through (averting) their gazes (Stifter & Moyer, 1990), and participate in
‘protoconversations’ with their caregivers (Bateson, 1971; Trevarthen,
1977). This comes down to what Trevarthen has termed ‘primary
intersubjectivity’, where infants and caregivers are “mutually regulating one
another's interests and feelings in intricate, rhythmic patterns,” showing the
infant’s “active and immediately responsive” sensitivity to his surroundings
(Trevarthen & Aitken, 2001).

Within dyadic interactions infants already familiarize themselves with
perspectives. Interactions are playgrounds for developing and practicing
pective-taking. This can be most clearly illustrated in games like peek-a-
boo and hide-and-seek.

Peek-a-boo and, later on, hide-and-seek are very popular games that
can be repeated over and over again, without diminishing the joy and
ement of the infant. These games are interesting for our purpose
because they reveal a very early and increasing awareness of the difference
between one's own and the other's perspective. Both show a similar
structure of staying in contact while interrupting visual communication,
indicating that perspectives are not just visual but may involve all the other
senses as well: touch, taste, smell, and hearing. To play peek-a-boo, all that is
eeded is that there is some obstruction between the eyes of the infant and
of the other person, whereas in hide-and-seek not only the gaze is
interrupted, but also physical proximity and sometimes verbal
communication. In peek-a-boo, both the infant and the other can regulate
the reunion of the gazes by removing the obstruction, or by moving their
heads. In games of hide-and-seek there is a clear division of roles in which it
is usually the child that hides and the adult that seeks, but the reverse is also
possible.

We argue that both games assume the awareness of the other person's
pective. In the case of hide-and-seek, this is obvious since the ability to
hide presupposes the ability to put yourself in the other’s position. For
instance, the child hides behind the couch because it knows that it is out of
daddy's view there when he enters the living room.

Peek-a-boo rests on an even more basic capacity. Infants 'know' early
on when someone is looking at them (Reddy, 2003) and are sensitive to the
contingency of the interaction. In Murray and Trevarthen's famous double
video experiment, infants first communicate with their mothers through a
live television link (Murray & Trevarthen, 1986). When they are then shown a recording of the mother’s earlier behaviour, they become upset, suggesting that the infants are aware that the interaction with the mother is now not live. More generally, the infants’ reactions show their sensitivity to the timing and contingency of the interaction².

The excitement of peek-a-boo is that the infant knows that the other person is looking at him without being able to see her gaze directed at him. It is a kind of magic: the other’s gaze is gone, but not really: the gaze goes on behind the cloth so to say. Without any visual confirmation the infant senses that the other is not only still present, but also remains directed at him.

Some variations may cause extra excitement: popping up from an unexpected angle, popping up with a silly face, or wearing a hat, etc. But these variations cannot be stretched endlessly: when a different person pops up, the infant is not amused (Parrott & Gleitman, 1989). And of course, in that case, it is not really a game of peek-a-boo anymore: the infant supposes to still be in contact with a specific other while in fact he is not.

To stay in contact is crucial for hide-and-seek too: through the act of seeking, the attention is still directed at the child. Hiding only remains hiding as long as the other person is indeed seeking. If not, there is no real interaction and thus no game going on. The father should be really ‘searching’: he cannot just do the dishes while the child is hiding and then go straight to the child’s favourite hiding place to ‘find’ it. The thrill for the child is not only whether dad will find him, but also to trust that dad will search for him. Are we really still in contact? To trust in this contact even though one is not only out of direct sight, but even hidden, is the scary element, with the worst-case scenario of being forgotten. To affirm that the contact is still sustained, the seeker will often wonder aloud: I wonder where Amelie could be…?

Moreover, both games require an attuned timing of the interaction: the time to reappearance or finding should not be too short (for building up the suspense) and not too long either (the child might worry if it is still in contact). This varies not only from child to child, but also depends on age: hide-and-seek is already more of a challenge than peek-a-boo.

From peek-a-boo to hide-and-seek we can already witness an increase in the possibilities for interaction: Interaction can take place without direct visual contact, and even without physical proximity, relying on both the child and the other continually being directed at each other.

How do these forms of interaction enable perspective-taking and growing awareness? In peek-a-boo and hide-and-seek, infants experience and sustain a partially interrupted contact for some time, and thereby sense the other’s awareness of themselves outside of immediate contact. Thus, they develop an awareness of the other’s perspective as detached from the immediate contact. This is an early form of taking an excenctric position in

²Whether this sensitivity can be relayed to an internal ‘contingency detection module’ as Gergeley and Watson (1999) propose, or is rather constituted in the interaction process itself is a matter of debate (De Jaegher et al, forthcoming; De Jaegher, 2010).
the sense of de-centring from the primal perspectival point, and thus gradually loosening the tie with the here and now.

Peek-a-boo and hide-and-seek are good illustrations of this sensitivity to perspectives, which is also present in other kinds of interactions. Reddy has pointed out that, from the age of two months already, infants "react to attention to self with a variety of emotional reactions" (Reddy, 2003, p. 397). She argues that this is already a form of joint attention, in which the 'object' attended to is the infant himself.

B. Joint attention & pointing

Joint attention is taken as a hallmark of the infant's acknowledgement of the fact that the other person has a perspective of her own. Infants are generally taken to start being able to do this between 9-12 months of age, but whether it is only then that infants start to realise that others have their own perspective is a matter of contention (Reddy, 2003, Racine & Carpendale, 2007). This debate is a good starting point for our purposes. As Racine and Carpendale (2007) point out, divergent approaches to joint attention are possible: it can be conceived minimally as involving little more than simply looking “where someone else is looking” (Butterworth, 1998, p. 171, cited by Racine & Carpendale, 2007), and, at the other extreme, it can be thought to involve the participants’ knowing that they are sharing attention (Tomasello, 1995). It is the second, more cognitively demanding conception that is at the basis of the idea that joint attention develops at around 12 months.

Here we will, rather than concur with either side of the debate and thereby continue to think in dichotomies, again attempt to capture the continuum. Rather than trying to establish which is 'the true underlying competence', which Racine and Carpenter rightly advise against (Racine & Carpendale, 2007, p. 8), we will, like they suggest is necessary, attempt to get to grips with the idea that infants pass through different forms of understanding (see also Chapman 1987, cited in Racine & Carpendale, 2007). In order to do this we will, like before, take a phenomenological route.

Simply looking where someone else is looking is too minimal a requirement for joint attention, because there is not necessarily awareness of the jointness. Only when both participants are aware that they are looking at this thing can we speak of true joint attention. At the basis of this shift between what could in principle be a merely coincidentally converging attention to being aware of sharing this object of attention lie the interactional activities of emotion and feeling sharing. In experiencing and establishing this, the interaction of gazes, or eye contact, is crucial. For, as Stawarska indicates, referring to Gomez (Stawarska, 2006, p. 19), “in eye contact you not only observe the eyes of the other person but are also checking her attention, while the other person who attends to your eyes is checking your attention as well. In other words, the other is attending to your attention while you are attending to hers”.

The joint activity of pointing can illuminate how infants develop new
possibilities for acting and interacting. They expand their perspectival capacities through and in their ongoing experience of recurring activities that they engage in with others. Pointing develops into a form of joint attention when both infant and caregiver are aware of their shared attention to an object.

Originally, pointing is only a simple, but incomplete grasping movement directed towards a desired object. The child's failed reaching may provoke a helping reaction from the caregiver. Thus, it is exactly by the occurrence of a 'mismatch' that the meaning of the action changes. In the 'thwarting' of a goal, a gap opens up for potential new meaning. The individual reaching movement can then turn into a 'gesture for others'. The meaning of reaching changes, and develops into a new possibility for interacting with the (social) world: pointing. Gradually the child learns to use this new meaning-in-movement, which is also shown by his looking back towards the mother to make sure that she has seen the object as well. As we can see, the intention of pointing does not reside within the child's mind, but emerges as an outcome of their ongoing social interactions. This example shows that intentions may be formed not only individually but arise through participatory sense-making. Meaning and intentions are emergent products of socially embedded interaction, and in many situations they can be viewed as distributed phenomena rather than as individual, private mental acts or properties (De Jaegher, 2009a, b).

A behaviouristic refutation of our interpretation would be Perner's argument that infant pointing follows an associative schema established between his own actions and his mothers' reactions (Perner, 1991). The infant could have learned by conditioning how to successfully control his mother's gaze. We agree with Reddy and Morris (2004) that this kind of argument establishes a dualistic opposition of an exclusively behavioural exterior and an unobservable interior mind, where the mentalistic abilities develop on a separate track, unconnected to a meaningful interaction. This is indeed an undisprovable position, since "any pointing, however complex, and even if performed by adults, could always be seen to have prior associations with people's reactions and reinforcements" (Reddy & Morris, 2004, p. 657).

The only way to solve this problem is to take behaviour as intentional from the very beginning, in line with what phenomenologists and enactivists have argued in detail (Merleau-Ponty, 1945/2002; Scheler, 1954/1923; Thompson, 2007). Reddy and Morris argue that we are in a better position to grant the inherent meaningfulness of behaviour if we as researchers adopt an engaged, second-person approach rather than work as detached third-person observers. Only by engaging with the infant are we able to appreciate the fact that there really is interaction going on, even with very young infants.

Even though this approach cannot be 'proved' either, it is both phenomenologically more justified (experience as explanandum is taken seriously) and more parsimonious. A behaviouristic or mind-reading
account has to construct a potentially endless number of ‘epicycles’ in order to account for, in the first place, the ‘labelling problem’: How to know which external events to apply the results of the internal mentalisation to? How to connect these results with certain observable behaviours? In order to solve this problem, the cognitivist account needs to postulate extra modules, such as an ‘eye-direction-detector’ for understanding gazes, or even an ‘intentionality detector’ (Baron-Cohen, 1995). In sum, if actions were not meaningful in themselves and perceived as embodied, animate and agentive, social understanding would either require an inordinately complicated mechanism, or the capacity would be much more fragile than it is in real life. The approach we put forward here is parsimonious in that meaning is created in the lived experience of connection and disconnection, which is inextricably bound up with the dynamic physicality of interaction (Fuchs & De Jaegher, 2009).

C. Triadic interactions

To date, primary intersubjectivity has mostly been investigated in dyadic interactions. However, already in the first year of life the child also engages in interactions including a third person who is often the father. This expands the possible scope of awareness of perspectives: When a third person witnesses a dyadic interaction, the infant becomes aware of a view on this interaction itself. This triangulation of interaction has recently been investigated, above all, by the Lausanne group of Fivaz-Depeursinge (Fivaz-Depeursinge & Corboz-Warnery, 1999).

Just as in the games of peek-a-boo or hide-and-seek, the third person is present and absent at the same time. The child becomes aware of his interaction with the mother being witnessed by the father who may at first not take part in it. This already opens the enclosed cycle of dyadic interaction where the intensity of the mutual exchange mostly overrides the awareness of the difference of the perspectives. Now there is an additional view from outside, a view on the relation itself — a perspective that is not occupied by mutuality, so to speak. Breaking up the dyadic cycle, the third person’s perspective may also be called an excentric view (Plessner, 1975).

Moreover, in triadic interactions the perspectival role often changes: At one time, the child and the caregiver playing with each other are observed by the third person, at another time, the child himself will become the observer of his parents interacting with each other. This variable dynamics of triangulation is a decisive presupposition for acquiring an understanding of perspectives as such: Being the other, the witness or observer is not bound to a certain person, but is possible for each of us, or for everybody. The child begins to understand what one can see or do from a certain point of view. In Mead’s terms, he realizes the ‘generalized other’ (Mead, 1962). This is the foundation for acquiring self-consciousness in the full sense: to reflect on oneself presupposes an excentric position, or to look at oneself from the point of view of the other.

The psychosocial development of the child is thus crucially dependent on acquiring the capacity to change between the dyadic and the triadic
mode of interaction. Including the third person into one’s awareness means to integrate the external or social space into the present interaction, thus gaining distance and additional degrees of freedom in one’s relationships. The child is no more ‘at the mercy’ of the person he interacts with, because there is, in principle, always still another point of view. Thus, he increasingly acquires a sense of objectivity, neutrality and equality. Triadic intersubjectivity is necessary in order to become a person in the full sense: to recognize oneself as one among others who are intentional agents like oneself.

On the other hand, realizing the interaction of the other and the third (or mother and father) is also the fundamental experience of exclusion, and thus of emotions such as jealousy and envy. The resulting oedipal constellation has been famously emphasized by psychoanalysis as the crucial basis of child development: The father is a threat to the primary dyad, but at the same time the representative of the generalized other, of the rules of society or ‘the law’ (Ruskin, 1971, Bürgin, 1998). Coping with the affective challenge of triangulation, for example through identification, internalization or by other means, is thus an essential part of acquiring the capacity of perspective-taking.

D. Awareness

In the above descriptions of the more and more complex forms of interactions that infants engage in, we saw that these changes in interactions involve changes on the level of the infants’ awareness as well. We now summarize the impact of these interactions in terms of the infants’ growing scope of awareness. First of all, infants have an awareness of themselves and others. This awareness is both expressed and practiced in different forms of dyadic interactions — such as the games of peek-a-boo and hide-and-seek that we analyzed. We can already speak here of a mutual awareness, since both infant and caregiver attune, and coordinate their interactions through looking, moving, touching, and vocalizing and thus are obviously aware of each other.

When the interactions start to involve objects as well, infants become familiar with joint awareness. In dyadic interactions, the infant experiences that his actions can have certain effects, for instance that his mother comes when he cries, that she answers his smiles, etc. In cases of joint attention, the sphere of influence of the infant is considerably expanded, since he can now not only try to modulate the other’s attention to him, but to objects as well. In a sense, he can stretch the scope of his own perspective to include the perspective of the other. It is likely that this will further increase his awareness of what the other person is capable of, thus making the other’s perspective and experience of the world more tangible.

Triadic interactions happen from the very start of the infant’s life. They foster yet another level of awareness, for when a third person witnesses the dyadic interaction that the infant is engaged in, he becomes aware of the possibility of a perspective on this interaction. Thus, although the infant was already engaged in such mutual interactions, and was aware of both himself
and of the persons he was interacting with, he can now become aware of the relation itself. This transition from simply engaging to awareness of one’s engagement means an increase in reflectivity (De Haan, 2010). The child senses the other’s view and this opens up the possibility to experience an outside perspective on the interaction.

Even more advanced is the ability to imagine the other’s perspective as such — that is, outside of a direct interaction. Both in the games of peek-a-boo and hide-and-seek and in triadic interactions, the infant gets familiar with the presence of an absent perspective, so to speak. In peek-a-boo and hide-and-seek we saw that there is an interruption of the immediate contact between the infant and the other person. The other person is still there, but her perspective is not directly visible at that moment. In a similar way, in triadic interactions, there is the presence of a perspective that is not an immediate part of the interaction, for instance when the infant and his mother are observed by his father. The infant does not have a direct contact with his observing father; their contact is in a sense suspended. This is not to say that there is a complete lack of engagement, it is rather an indirect form of engagement. In these ways the infant gets to know absence, and can practice his imagination of another’s perspective as such.

This ability to speculate about others who are not present is usually taken to be the ultimate proof of the child’s awareness of the other’s perspective. As such it is the common target of theories on social cognition, as measured by false belief tasks. In the next section, we will criticize the importance that is attached to these tasks and to what they measure. The focus on this last step in the development of the child’s sensitivity to his own and others’ perspectives may easily lead to overlooking the importance of the interaction process. Although the development of social understanding expands to this very abstract ability, we argue that it is through social interaction that we practice and acquire the skills that we eventually learn to use outside of direct interaction as well.

We can describe this expansion of the awareness of perspectives as a growing capacity to distance oneself from the here and now. The first forms of interactions are all ‘here and now contact’. It is not hard to see their embodied nature since much contact involves touch and gestures. However, already in the here and now contact an element of transcendence is involved. A dimension of transcendence is already present in the infant’s engagement with his own body. In discovering his body and its possibilities, he experiences his body both from within and as a ‘thing’. This learning is of both ‘what can I do’ and ‘what can it do’. Phenomenologists refer to these aspects as the ‘lived body’ (Leib) and the ‘living body’ (Körper) respectively (Husserl, 1952; Merleau-Ponty, 1945/2002; Fuchs, 2008; Legrand, 2006).

Another way of transcending the present is through the experience of expectations. Husserl (1985) describes time-consciousness as a process in
which the present moment inherently contains a reference to both the moment that has just passed (‘retention’) and the moment to come (‘protention’). He famously refers to hearing a melody to argue for the continuity of experience rather than a string of single experiences. These implicit expectations expand with experience, reaching into the further future and past. Stern (1985) describes the formation of what he calls ‘generalized episodes’ such as a “breast-milk’ episode’ (p.95): interactional patterns that the infant gets familiar with. Similar situations elicit related expectations. Although one could describe the formation of expectations as a matter of the child building ‘associative schema’s’ à la Perner (1991), we propose that these generalized episodes are interactional patterns — which are best understood as embedded and embodied forms of memory, rather than heapings of representational contents. As noted before, only by acknowledging that the infant perceives behaviour that is already inherently meaningful, can we avoid the so-called ‘labeling problem’ (in this case how, starting from a variety of actions from the mother, the infant can expect to be fed).

A further step comes with the development of fantasy and imagination. Although these may seem highly ‘internal’ activities, it is likely that they too are practiced in interactions, such as playing and reading stories. Pretend play marks an important transition in this respect. Pretend play is an excellent example of participatory sense-making, because the new meaning attached to an object requires the endorsement of both participants. Together they make it true that the banana is a telephone (Leslie, 1987). Finally, language acquisition, itself interactionally realised, is crucial both as a means to and application of the ability to reach beyond the immediately given.

The acquisition of language is often hailed as a decisive step in the child’s growing reflective capacities. Although obviously of great importance, Stern (2009) points out that linguistic experience is not the only form of reflective experience available. Besides, language use too has a bodily dimension and is interpersonally structured. He furthermore argues that the transition to language should not be seen as a breach in development: we witness here the same process of trial and error that characterizes all learning. Instead, Stern emphasizes the continuity between different forms of expression and experience. On his view, this continuity comes from what he calls ‘dynamical forms of vitality’ that characterize the ‘form’ or the ‘how’ of the experience or expression. For instance: “Anger can appear on the scene explosively, or build progressively, or arrive sneakily.

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4 Stern (2009) makes a distinction between pre-reflective, non-verbal reflective, and verbal reflective experiences. He argues that affect attunement and delayed imitation are examples of non-verbal reflective experiences, because in those cases infants register and compare (at least) two previous events. “This is tantamount to a reflexive experience.” (p. 321). Although we agree with Stern that reflection is not exclusively verbal (De Haan 2010), we prefer to reserve the term “reflective” for those processes that are in some way self-referential — unlike his own examples.
or coldly, and so on. So could happiness and its smile.” (p.314). He explicitly links these forms of vitality with the body: “it is these dynamic qualities that give the impression of ‘an inhabited body’ — an ‘inhabited thought process’, that is in action and alive, now. Without this, we would not experience a vital human being behind the words being said” (p.326-7).

Another advantage of speaking of forms of vitality is their obvious link with the affective dimension. Emotions, like the excitement and gratification in peek-a-boo and hide-and-seek, play a big role in the interaction process. Infants engage their whole body in the excitement, joy and apprehension of these games. We would however be a little bit more cautious when it comes to separating form from content: we would rather describe dynamical forms of vitality as expressions of emotional involvement. ‘Expression’ is not so much the form in which a neutral content gets shaped, but the expression is the involvement itself (Merleau-Ponty, 1945/2002).

II. The false belief about the false belief task

We have argued that it is an important step in children’s development to imagine another’s perspective outside of a direct interaction, but that this ability is itself learnt in interactions such as peek-a-boo, hide-and-seek, and triadic interactions specifically. For the last decades, the false belief task was considered to measure the ‘most developed’ form of this ability and was thought to be a definite test of mental state reasoning (Wellman et al., 2001) at least by the majority of researchers.

In the original version, Wimmer and Perner (Wimmer and Perner 1983) describe the task as follows:

‘A story character, Maxi, puts chocolate into a cupboard x. In his absence his mother displaces the chocolate from x into cupboard y. Subjects have to indicate the box where Maxi will look for the chocolate when he returns. Only when they are able to represent Maxi’s wrong belief (‘Chocolate is in x’) apart from what they themselves know to be the case (‘Chocolate is in y’) will they be able to point correctly to box x. This procedure tests whether subjects have an explicit and definite representation of the other’s wrong belief.’ 5 (p. 106)

The false belief test has been treated as the hallmark of a full-fledged and so-called representational ToM (Perner, 1991). But the clear-cut nature of the false belief task, distinguishing only between children who either pass or fail the task, is exactly what thwarts any attempt to give a gradual, continuous account of children’s developing awareness of an other’s perspective. It lies in the nature of experimental tasks to establish a dichotomy between those who pass and those who fail. In fact, it is the establishing of such a dichotomy that makes experimental tasks like the

5 The false belief task is sometimes referred to as the ‘Sally-Anne test’ after a popular version of the task (Baron-Cohen, S., A. M. Leslie, et al. (1985). “Does the autistic child have a theory of mind?” Cognition 21: 37-46.). Here, the child watches two dolls, Sally and Anne. Sally has a basket and Anne has a box. Sally has a marble, which she puts in her basket. Sally leaves, and Anne takes the marble and puts it in her own box. Sally returns, and the child is asked where Sally will look for her marble.
false belief task possible. The clear distinction between two groups must be explained and is consequently more easily related to ideas of a conceptual change or the ripening of inner modules. Any attempt to give a continuous developmental account seems to stop at the clear-cut dichotomy of the false belief task. For this reason, we will take a closer look at this task.

In spite of its popularity, the history of the false belief task’s application and success (success mainly in reproducing the finding that most of the 3-year-olds fail and most of the 5-year-olds succeed) is only slightly longer than the history of its critique. Bloom and German (2000) correctly stated that there is more to a ToM than understanding false belief and that passing the false belief task requires other abilities like inhibitory control, for instance. Although there have been many more critical voices, the false belief task is still considered to be a measure of social capacities. Here, we want to reconsider what the false belief task actually is about and what it says about the awareness of other persons in children who fail or pass the task. Interestingly, it is hard to find a satisfying answer to this question. The false belief test, again, is said to be a definite proof of children’s ToM. But here the next question arises: What is a ToM? Premack and Woodruff (1978) defined it as follows:

> An individual has a theory of mind if he imputes mental states to himself and others. A system of inferences of this kind is properly viewed as a theory because such states are not directly observable, and the system can be used to make predictions about the behaviour of others. As to the mental states the chimpanzees may infer, consider those inferred by our own species, for example, purpose or intention, as well as knowledge, belief, thinking, doubt, guessing, pretending, liking, and so forth. (p. 515)

This is probably the most explicit expression of the fact that ToM is about inference, something that is easily forgotten when one takes for granted that ToM tasks are assessing social abilities or awareness of others.\(^6\)

At this point, we want to draw an apparently obvious distinction. One has to distinguish between genuinely social skills and skills from other domains that can be used in social situations, for example logical inference or abstract mathematical thinking. If I think that Peter thinks that I am an idiot because I took his car last week without asking for permission and Peter thinks that I am probably angry with him because he thinks that I think that he knew that I needed the car urgently and he didn’t offer it to me, we have a problem if we do not talk with each other anymore and this problem could be labelled a social problem. However, the problem would

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\(^6\)ToM comes in two main flavours: Theory Theory and Simulation Theory, and some hybrid combinations of those two. Theory Theory argues that we rely on a folk psychological theory in order to predict and explain others. This theory is thought to be innate or acquired. Simulation Theory, on the other hand, assumes that we do not need a theory, because we can use our own experiences as a model: we can imaginatively put ourselves in the position of the other and work out what we would do in this case. The ability to simulate is also regarded by some as innate, and by others as an acquired ability. For a comprehensive overview, see the introduction of Dokic, J. and J. Proust (2002). Simulation and Knowledge of Action. Amsterdam/Philadelphia, John Benjamins.
certainly vanish into thin air if we just talked to each other and really interacted socially. In a way, the problem arises because we do not use our social skill to interact. Instead, we engage in something that resembles solving a difficult math problem. But exactly this kind of thinking has always been understood as the core of ToM because it is said to prove that we know about the fact that other people have their own thoughts, beliefs, etc. There is, in fact, more and more theoretical as well as empirical support to reconsider the false belief task as rather measuring reasoning abilities (Bowler et al., 2005; Riggs & Peterson, 2000; Riggs, Peterson, Robinson & Mitchell, 1998). Once again: if Peter thinks that I think he has a red King and I think that Peter thinks that I have a black Seven, this kind of thinking is relevant in a social situation like for example poker. But it would be a mistake to take this kind of thinking as the basis of our intersubjective grasp of the other. The same kind of thinking is involved in other domains, for example when experimental psychologists design experiments. Although the ability to think about others’ beliefs or thoughts can be important in social encounters, it would be a mistake to think that this kind of thinking is the cradle of our awareness of other human beings as having thoughts and emotions, etc.

We have suggested that it is important to distinguish between genuinely social skills and skills that can be used and applied in social situations. One could ask at this point what is actually meant by a genuinely social skill or by a genuinely social measure, respectively. We do not want to present a perfect definition here, but the label ‘social’ would at least presuppose a situation where at least two persons are interacting with each other — rather than thinking about each other outside of a direct interaction. Interestingly, all false belief tasks – the explicit as well as the implicit, the verbal as well as the non-verbal ones – are about absence. The skills they measure are skills that become important if I am not able to really interact with the other person because she is not present or because she is present, but not interacting in a transparent manner or not interacting with me. This raises, once again, the question whether false belief understanding should really be considered as a genuinely social ability.

To put this argument forward, let us take a look at two examples that put the false belief task as the hallmark of our social-cognitive skills into question. In Nicaragua, deaf adult Nicaraguan home signers are reported to fail false belief tasks (Pyers, 2006). If the false belief really was the hallmark of a full-fledged ToM, these adults wouldn’t have achieved it. Pyers (2006) reports that “although first-cohort signers struggle to accurately predict human behaviour when a false belief is involved, they lead otherwise normal lives, living with extended families, raising children, holding down jobs, and even navigating the Managuan bus system” (p. 223). She consequently raises the question how important the understanding of false belief actually is to the human experience. Although those Nicaraguan adults often fail the false belief task, they are far from being autistic members of their society.
On the subject, let’s jump from Nicaragua to the non-geographical, inner landscape of autism. Children with autism are severely impaired in ToM tasks and many of them fail the false belief task (Baron-Cohen et al., 1985). There are, however, high-functioning adults with Asperger who pass the explicit false belief task with ease despite having problems in social communication in their real lives as well as in more implicit measures (Senju et al., 2009).

Bringing together the findings from deaf Nicaraguans and adults with Asperger, we can say that there are people without a full understanding of false belief who lead a perfectly normal social life and people who pass the false belief task but live in isolation because of severe difficulties in engaging socially. How, then, can such great importance be attached to the false belief task? How can it be considered to measure something of great importance for social interaction?

Recent findings cast even more doubt on its importance. Different studies demonstrated an early understanding of false belief with eye measurement (Clements & Perner, 1994; Onishi & Baillargeon, 2005; Southgate et al., 2007) as well as with more behavioural measures (Buttelmann, 2009; Southgate et al., in press). As the age of onset of false belief understanding is dropping with every study, it is no longer reasonable to speak of a major developmental step or ‘conceptual change’. What is measured seems to be ‘there’ from very early on. The representational interpretation of false belief understanding (Perner, 1991) is far from intuitive, as it is very difficult to imagine such young children reasoning with embedded propositions or from a detached observational stance.

Despite this critique, the understanding of a false belief remains an interesting case that deserves explanation. Herschbach points out that whereas representatives of more embodied approaches to cognition and social interaction (Gallagher, 2005; Reddy, 2008) have no difficulties in explaining early social competencies of children in non-mentalistic, non-representational terms, “the phenomenological critics say little about false beliefs” (Herschbach, 2008, p. 41). The phenomenological critics of ToM propose that we perceive emotions and intentions of others in their expressive behaviour and do not have to infer them. Herschbach agrees on that, but “the cases they use to make this point and present their alternative conception of social understanding do not obviously cover the case of false belief” (p. 41). According to Herschbach, although we can adjust our behaviour depending on what we unreflectively know about other people's beliefs, it remains unsatisfying to call this a purely embodied practice that does not involve mental state attribution or mindreading at all.

Obviously, a lot depends on how one defines ‘mental states’ and ‘mindreading’. We do not want to deny the contribution of reasoning or drawing inferences about others’ intentions per se, but we think that it is important to connect these abilities with the primary embodied interactions from which they arise. The problem with talk of ‘mental states’ and ‘mindreading’ is that they are used in opposition to (bodily) behaviour,
assuming a dichotomy between the outward behaviour and the hidden inner mental states. The critique of phenomenologists is precisely directed against such a view (Zahavi and Gallagher 2008). Behaviour and intention cannot be taken apart like that, for we encounter the other's meaningful actions, not mere behavioural responses.

False belief tasks measure the child's ability to take into account the limitations of someone's perspective, usually as a result of being absent. Precisely this could be explained in our account, because the development of perspective-taking entails also a growing sensitivity to the limitations of perspectives. For instance, in hide-and-seek, children practice with the inherent limits of the viewpoint of their seekers. The ability to assume the perspective of the other on themselves increases as they learn that merely covering their eyes is not enough not to be seen. They find better and better hiding places, but within the boundaries of the current game (e.g. hiding outside when the game is taking place inside overshoots the participation in this particular game). Also in joint attention, the infant knows whether or not the caregiver is paying attention to the same object, thus showing that he understands that her attention might be somewhere else too. Again, we would like to stress that it is through these interactions that children learn these capacities.

To illustrate the differences in explanation, let us look at Southgate et al.'s study (2007). They show that two-year old children already have correct expectations about another person's expectations — even if they are 'false'. The child apparently knows that when the experimenter looks away, she cannot see what goes on behind her back (i.e. that the ball is put in the other box). For the experimenter, it makes perfect sense to look for the ball in the box where she last saw it, and apparently, the same goes for the child.

It may seem difficult to explain the children's correct anticipation without any reference to a concept of belief or mental states. One way to do it would be to assume that children behave according to behavioural rules like "A person will look for a thing where he or she has seen it at last" — a quick and ready explanation that is hard or even impossible to refute. However, it is intentionally meagre in a way that, in our opinion, does not do justice to the infant's abilities.

Another possible non-conceptual explanation, but one that does justice to the intentionality of behaviour, could be that the continuous process of expanding perspectives as described here gives rise to an understanding of false beliefs. On the basis of our description of the development of perspective-taking, it seems safe to assume that children at that age have enough experience with perspectives and perspective-taking to correctly anticipate the experimenter's actions. On our account, no dichotomy in the child's ability arises; it is part of his increasingly sophisticated grasp of perspectives.

False belief understanding presupposes that the child can take the perspective of other persons, including the implications of their having been absent. Although we have offered an alternative explanation, much still
needs to be worked out. The false belief task shows that, in order to strengthen an integrative account, we need to further develop not only the phenomenology of interaction but also the phenomenology of absence.

III. Mechanisms of change

In their review 'Social cognition in the first year', Striano and Reid (2006) conclude that "identifying the mechanisms of change should be among the major tasks for developmental scientists" (p. 471). What could these 'mechanisms of change' be?

The mechanisms of change should describe and explain how infants move from one stage in their development to the next. One option would be to postulate innate modules that 'ripen' in some way (Baron-Cohen, 1995; Carruther, 1996; Cosmides & Tooby, 2004). The difficulty lies in how to conceive of this ripening. If, on the one hand, we would take this as a completely automatic and internal process, then it would become impossible to explain the ample research that has shown that without the right circumstances certain abilities will not develop, or only in a distorted way (Schore, 2003). On the other hand, if we add the condition that these modules need 'favourable circumstances' to develop then the mechanisms of change are no longer (only) the innate modules, but rather the circumstances that lead them to develop or not. Even an appeal to innateness could not rule out the influence of the environment, since 'innate' simply refers to a developmental process that takes place in the womb, which is itself an environment.

The longstanding nature-nurture debate is heading, unsurprisingly, towards a synthesis of the two. If we acknowledge the influence of the environment, one of the central questions is how to define the 'favourable circumstances' that the infants need to proceed in their development. Now, 'favourable circumstances' sounds as if certain background conditions just need to be fulfilled, as if these were merely the stage on which the action (e.g. the mechanisms of change) can then take place. Such a static and passive description is treacherous, however, because it causes us to overlook that these conditions may in fact be processes — including the process of interaction between infant and caregiver.

This is in line with the commonsensical view that an infant needs, first and foremost, somebody who cares for him — not only in the sense of meeting his basic physical needs, but also as emotional involvement in the infant’s well-being in general. There is more to favourable circumstance than merely being kept alive. It is important to note that there is no one-answer-fits-all to this question: proper care is about attending to the needs and joys of this specific infant. Therefore, in order to find out what the infant needs, the caregiver has to communicate with him. The better this communication is attuned, the more likely it is that the child’s needs are met. Thus, no matter how we specify the favourable circumstances exactly, the need for communicating with the infant will inevitably be part of the
process of tailoring the care to this infant. Thus, interaction is indispensable. We suggest that it is this interaction process that stands at the basis of a healthy development in general, and of the development of the sensitivity to others’ perspectives in particular. The interaction process is an important part of the mechanisms of change.

Conclusion

We will end by summing up the advantages of an embodied and embedded account of social development compared to the cognitivist model. Firstly, the account that we have presented here allows to conceive of social development on a continuum, rather than as a matter of separate stages and abilities that stack on top of each other much like building blocks. We have tried to avoid using dichotomous terminology such as implicit versus explicit or pre-reflective versus reflective, in order to bring out the developmental process spanning both ends, instead of opposing them as separable categories.

Secondly, we have conceived of the mechanism of change in this social development as the interaction process itself. The advantage of this is that it elucidates the connection between experience and the developmental mechanism. This development is a form of learning by doing, where the capacities that are needed for specific interactions develop in these interactions. Even the mechanism is learned. Traditional accounts often presuppose that capacities should already be acquired before one can put them to practice. In our view, capacities are themselves practiced. They are not ready-made but adjust dynamically to the developmental path.

Thirdly, following this view, we can say that social skills are themselves interactional (Di Paolo et al., forthcoming, McGann & De Jaegher, 2009). This means that what the child is able to do depends not only on the child, but also on whom he is interacting with and on the environment in which the interaction takes place.

Fourthly, on this approach, it becomes unnecessary to postulate conceptual knowledge at the basis of social capacities. The mechanisms we propose are not so cognitively demanding. Moreover, no invisible entities are needed for the explanation of social interaction. With its focus on the visible and experiential, this approach has the advantage that it lends itself very well to experimental investigation, where it becomes possible to rely only on what is there in the interaction instead of assuming hidden modules. In other words, to consider what is at stake in social understanding as accessible in the interaction process makes explanations more parsimonious and direct.

We can also conclude that a lot more work still needs to be done. On a theoretical level, the challenge will be to elaborate on the phenomenology of absence. Is it possible to do justice to the phenomenon of false beliefs without buying in to the whole representationalist ToM framework? On an empirical level, the challenge is to design experiments that start from a more interactive approach — and investigate how their outcomes compare.
to the traditional experiments on the development of social skills.

References


