Interpretational Complexities in Developmental Research and a Piagetian Reading of the False-Belief Task

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Abstract

Theorizing about children's early development is beset with interpretational complexities. I argue that there is a general tendency to over-interpret the experimental findings, and that one of the main causes of this is the difficulty of disengaging from our adult frame of reference when theorizing about the young child's mind. One domain where this holds is children's ability to differentiate themselves from others. In relation to this I first critically analyze some cases of interpretational complexities, and then apply my methodological and conceptual concerns to children's perspective-taking abilities. This has a specific bearing on the classical false-belief task, which is a perspective-taking task. Part II proposes a new, what I call, a 'Piagetian reading' of the false-belief test. My new interpretation of the test suggests two different ways of perspective-taking of which one is egocentric in Piaget's sense. Concluding Part III elaborates on some implications of the proposed reading of the test for a number of findings in the Theory-of-Mind field.

Keywords Interpretation · False-belief task · Egocentrism · Piaget

The main purpose of the paper is to discuss some rarely addressed interpretational complexities in developmental research and, as a result, present a novel, what I call, 'Piagetian reading' of the false-belief test.

In carrying out investigations of complicated psychological phenomena, developmental scientists, to some extent, have the possibility to manipulate these phenomena in experimental settings. However, children's achievements, in these investigations, often do not provide researchers clear and unambiguous answers to the research questions they pose. The outcome of such research is heavily dependent on what the

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developmentalist reads into the observed data. Disengaging from an adult frame of reference can be crucial for him detecting the child's ignorance of the social surroundings as these surroundings are understood by the researcher. In what follows I elaborate on these issues in the context of the self-other differentiation debate; that is, the domain of developmental research concerned with the child's ability to differentiate between herself and those around her.

The self-other differentiation complex (which is briefly summarized at the end of this introduction) has a specific bearing on the classical false-belief test.¹ According to a widely accepted interpretation of findings in developmental psychology, the differentiation between self and other is reached if not at birth then at 1.5 to 2 years of age. However, when children younger than 4.5 years are asked where another person will look for an object that, unbeknownst to this other, has been relocated (the false-belief test), they answer as if there were no other belief than their own. As I see it, children who fail the test cannot be seen as completely differentiated from the other person. Conversely, children who pass the test show their appreciation of the other as a subject who has her own view on the world and thereby demonstrate their differentiation from that other person.

What has been said comprises two interrelated claims. Firstly, an ability to see another person as a subject with *her own* view on reality presupposes a differentiation from this other person. Secondly, this differentiation is put under the test in false-belief settings. The first of these two claims is quite uncontroversial while the other presents a novel and rather unexpected turn on the false-belief task. Children's accomplishments in the verbal false-belief test set the bar of self-other differentiation much higher than was previously accepted.

Do children apprehend themselves as separate from others at 2 or at 4.5 years of age? To my knowledge, this question has not been discussed in the literature.² I see two causes for this. For some researchers, a certain misunderstanding of Piaget's concept of egocentrism seems to have played a role. Another important factor is the above-mentioned difficulty of disengaging from an adult frame of reference when theorizing about the young child's mind.³

Part I and the main portion of Part II are devoted to a discussion of the claim of a much later self-other differentiation I here pay special attention to the discrepancy between the two levels of scientific inquiry: the level of observable behavior and the level of the theoretical interpretation of this behavior. The investigation unfolds into a new, what I call 'Piagetian reading' of the classic false-belief test (the last section of Part II). The basic idea of the new reading is that there are two ways of perspective-taking involved in the test, one of which is egocentric in Piaget's sense.

If my interpretation of children's failure in false-belief settings is correct, then the robust findings of meta-research on false-belief endeavors (Wellman et al. 2001)

¹ Below, the classical false-belief test is also referred to as "the verbal false-belief test", "the explicit false-belief test" or (when context allows) simply "the false-belief test".

² However, the broader conjecture that the self-other distinction goes together with understanding other minds has been used by researchers in their theoretical reasoning (e.g., Hobson 1990; Reddy 2008; Colle et al. 2008; and Southgate 2019).

³ This difficulty may give rise to what William James calls 'the psychologist's fallacy': "The *great* snare of the psychologist is the *confusion of his own standpoint with that of the mental fact* about which he is making his report" (James, 1998, vol. 1, p. 196, italics in the original)

present overwhelming evidence against an early self-other differentiation, at least, in the sense of the children's ability to regard others as objects of knowledge and to acknowledge these others as subjects with their own view of the world. This part is what I call the 'epistemic' level of distinguishing self from other.

Notably, there is also an extensive debate on children's early implicit mentalizing abilities. The accounts of children's early mentalizing presuppose a complete self-other differentiation at a much earlier age than their success in the classical false-belief task. This is at odds with the Piagetian reading of the test according to which a child who fails the test cannot yet fully differentiate herself from another person and thus cannot have a theory-of-mind about this other person. Part III discusses the impact of the Piagetian reading of the false-belief-test on a number of issues in developmental psychology. One important part of this discussion concerns the question of children's early theory-of-mind capabilities.

Here is, then, a brief summary of the self-other differentiation debate.

We are social beings. Our understanding of ourselves develops through a continuous and sophisticated interplay with others. There are different theoretical standpoints concerning this development, however. One of the core issues is the question of the self-other linkage and differentiation in the first two years of a child's life. Some researchers believe that such differentiation is already in place at birth (e.g., Reddy 2008; Meltzoff 2007; Ruffman 2004), while others think that there is an initial stage characterized by a relative lack of differentiation between self and other (e.g., Barresi and Moore 2004; Carpendale and Lewis 2004; Hobson 1990, 2004; Müller and Carpendale 2004; Rochat and Striano 2002).

Most of those who adhere to the latter view distinguish between *perceptual* self-other discrimination (e.g., the ability of neonates to respond differently to their own touching and other people's touch) and a later acquired *understanding* of the distinctiveness between the self and the other (as shown, e.g., by children's linguistic abilities in mastering personal pronouns and perspective-taking). There are also many different ways to talk about self-other differentiation. However, a general problem with various theoretical accounts is that the crucial terms 'self', 'other', 'understanding' and 'differentiation' are seldom if ever defined.

A close reading of many papers in this area suggests that these crucial words are often understood intuitively in terms of what, lacking a better term, I will call *true* self-other differentiation. That is, researchers seem to advocate the kind of understanding in which the self is seen as an object to be experienced, observed, or reflected upon *from the view of the other*. For example, in Hobson's (1990) words, the child's

... differentiation from other persons, together with his or her experience of being an "object" in the world of others, leads the child to realize his or her potential for taking an outside perspective on him- or herself and his or her own attitudes, and so to acquire self-reflective awareness in the second year of life. (Hobson 1990, p. 173).

Likewise Reddy (2008, p. 121) refers to the child's awareness of the self, as "experiencing, long before conceptualizing, the self as an object to others." But, if the self is to be grasped as an object from the view of the other, then the other must not coincide with the self. This is not a claim with which any of the researchers mentioned so far would

disagree. However, to my knowledge, none of the participants in the debate discuss the nature of the crucial developmental achievement captured by the mastery of the false-belief task – a procedure that puts to test the prerequisite of the *epistemic otherness* of the other. What this achievement precisely implies will be elaborated on below.

As a challenge to the thinkers quoted above, I would like to raise the following question. What sense should we give to the statement that young children already at the age of 18–24 months understand that they are distinct from others but still fail, until the age of 4–5 years, to recognize the other's point of view on reality as different from their own (i.e., fail the false-belief test)? Since the child who fails the test does not accept that there is another view of reality than her own she cannot, I argue, see other people as existing in their own right with *their own* beliefs, desires, and intentions. This view boils down to the claim that, until the passing of the false-belief test, a most important kind of self-other differentiation has not yet been achieved. As long as this theoretical aspect (what I will call an epistemic reading of the false-belief test) is not accounted for, the self-other differentiation debate overlooks an important cognitive criterion of this differentiation. While claiming this, I completely agree with Müller and Carpendale (2004) and others that social development is a gradual process that takes place in a sequence of levels. However, my purpose is not to identify the organization of these levels, but rather to pay attention to an important cognitive achievement that has not been appreciated sufficiently in earlier research. In section 3.2, I reflect upon some possible manifestations of the gradual emergence of the self-other distinction.

Given that most current research in the area claims that self-other differentiation, in the 'understanding' sense, is achieved if not at birth then at latest at 1.5–2 years of age,⁴ the claim of a much later accomplishment of self-other differentiation may appear as, *prima facie*, unintelligible. However, the researchers' adult frame of reference in theorizing about their findings can impact on the understanding of phenomena that are not yet structured in accordance with our grown-up conceptual understanding. Or expressed differently, not being attentive to the fact that 'self' and 'other' are loans from the standard descriptions of adults may lead to projecting these concepts onto the child's understanding of reality. This is not just a question of terminology. The point is this: employing unfit terminology tends to distort our understanding of phenomena.

1 Part I. The Dilemmas of Scientific Interpretation of the Child's Development

I now turn to the analysis of some examples of developmental and cognitive research. My discussion is divided into three sections where I pay special attention to two different levels of scientific inquiry: the object-level of observable behavior and the meta-level of interpretation. The choice of studies in the examples discussed is strategic in that they clearly illustrate the points I wish to make. However, these studies are just examples chosen from large body of research. Importantly, my aim is not to criticize

⁴ Researchers support this conclusion by referring to a variety of phenomena. For example, the ability of young children to pass the mirror-self-recognition test (Barresi and Moore 2008), 18-month-olds' understanding of desires – that others can like something that they themselves do not (Repacholi and Gopnik 1997), and the ability to understand what is seen or not seen by someone else from that person's different point of view or perspective (Moll and Tomasello 2005).

certain researchers but to prepare the ground for a new interpretation of data and to elucidate a general problem implicitly built into the scientific inquiry of mental development.

1.1 Self-Related and Other-Related Stimuli

There is a range of findings showing that newborns will respond differently to external and self-originated stimulation. These findings (e.g., Rochat and Striano 1999; Trevarthen and Aitken 2001) are seen by many as empirical evidence for the presence of self-other differentiation at birth or in early infancy. Some examples are given below.

In response to psycho-analytic interpretations and findings in the developmental psychology tradition following Piaget, Reddy (2008) opposes what she sees as a crucial misapprehension, namely, that an infant at birth is “shrouded in a profound confusion between the self and the world” (p. 123), and cannot tell herself apart from the people around her. In refuting this view, Reddy discusses some contemporary findings in developmental psychology. For example, referring to the studies of distress-crying in neonates (Martin and Clark 1982; Sagi and Hoffman 1976) she argues:

The phenomenon of newborns crying when they hear other babies crying (for example, the well-known chaos in neonatal nursery units in hospitals) was previously used as evidence of a confusion between the boundary of the self and the other (that is, that an infant hears another baby crying, and not knowing this is another baby, starts – or rather, “continues” to cry). However, such crying is in fact less confused than it appears: newborns will cry more to the tape-recorded cry of another infant than to their own, showing an awareness of something different about their own voice ... (Reddy 2008, pp. 123–124)

Reddy (2008) also refers to an example of conjoined twins (Stern 1985), where one pair of twins at 3 months of age could distinguish between sucking their own fingers and those of the other twin. There is yet another study of Rochat and Hespos (1997) showing how neonates could distinguish between their own touching of their cheeks and other people’s touch. In Reddy’s view, these observations show, “that neonates can distinguish *themselves* from *others* and can perceive similarities and differences sufficient to allow them to act coherently or to imitate others” (p. 124, my italics).

The examples cited by Reddy (2008) do reveal something very important: the innate capability of newborns to discriminate between self-related and other-related stimuli. The fact that two stimuli can be experienced as different – two tape-recorded cries, two fingers in the mouth or two touches of their cheeks – is undoubtedly a clear sign of a beginning self-other differentiation process. However, these findings do not yet imply that different stimuli are apprehended by newborns as being connected to some entities that are understood by the children as ‘others’ and ‘themselves,’ respectively. Contrary to Reddy’s conclusions, Rochat (2001), in comments on both Daniel Stern’s observations of conjoint twins and his own investigations in collaboration with Hespos (those to which Reddy refers), notes that these observations of infants’ behavior are “just accounts of discrimination. They do not really explore what this discrimination entails in terms of infants’ understanding of their own bodies” (pp. 43–44). This is also in accord with the results of Rochat’s and Striano’s (Rochat and Striano 2002) research

indicating that by 4 months of age infants show signs of perceptual discrimination of their own versus someone else's specular image. As Rochat and Striano observe: "Signs of such discrimination do not mean that infants from 4 months actually recognize themselves or express conceptual self-awareness" (p. 44). In Müller's and Carpendale's (Müller and Carpendale 2004) words, newborns' "discrimination or differential responding do not enable us to determine whether the meaning of the discrimination is grasped" (p. 222).

In line with Rochat, Striano, Müller and Carpendale, I claim that the empirical findings quoted above are consistent with the hypothesis that the question of who is the self and who is the other can neither be actualized nor answered by the child. The fact that this very question is formulated and answered by the researcher does not imply that the involved concepts are appropriate for describing the child's interpersonal world of relations. When Reddy (2008) writes: "Their crying in response to other infants' crying, then, seems to be some sort of sympathetic cry rather than one born in the confusion of not knowing that it was not one's own cry" (p. 124), the usage of such expressions as: 'confusion,' 'knowing' and 'one's own cry' are all problematic – newborns cannot 'confuse' what they do not yet distinguish as 'oneself' and 'other.'

Note that my point is a methodological one. It concerns scientific interpretation. If the researcher claims that infants show "an awareness of self as an object of others' attention" (Reddy 2003, p. 397) she also needs to be clear about what such terms as 'self,' 'self as an object' and 'other' mean in their application to the child. In any other case, a danger exists that the researcher's adult reference frame will color the interpretation of the child's perceptual discriminating abilities.⁵

This danger is reinforced by the lack of an adequate terminology or, more generally, from the limitations of available linguistic means for formulating scientific theories about the undifferentiated-ness of self and other.

1.2 The Necessity of Applying a Foreign Conceptual Structure to a Phenomenon

The only language of scientific description that researchers on child development have at their disposal is one in which 'self' and 'other' do refer to distinct entities. So, for example, in reflecting upon three studies involving children and adolescents with autism, Hobson and Hobson (2008) suggest that the intersubjective dimension of social relatedness acquires its structure "in virtue of human beings' propensity to identify with others' attitudes" (p. 67). It can appear from this description as if the child would recognize, after all, two different attitudes – her own attitude and that of the other. However, the actual situation (when applied to a child who does not yet differentiate herself from the other) cannot yet be discussed in terms of the different subjects'

⁵ It might be suggested that Reddy's view is that by experiencing being an object of other's attention may the child learn what it means to be a subject and therefore become able to regard self and other as subjects. However, her argument hinges on an ambiguity of the phrase "experiencing being an object of others' attention". The expression could be taken as entailing an awareness *that* one is an object to other's attention. But even though such an awareness would be relevant, it would mean conceptualization and is hence excluded by Reddy's (2008) formulation (see my Introduction). Alternatively it could mean "having an experience that is common/typical when one is *actually* an object to other's attention". It is far from obvious, though, that this experience could teach the child what it means to be a subject, and help her regard self and others as subjects.

attitudes. Indeed, given the nature of the case, it is extremely difficult for an adult to adequately describe the child's undifferentiated mental state.

Another example concerns the way in which the notion of shared experience can be (mis)understood. The word 'share', when applied to the earliest stage of the child's development, may denote the researcher's explication of the phenomenon, intimating that the child, after all, apprehends two subjects between whom the experience is shared. One talks, for instance, in terms of "the sharing of one's inner subjective experiences with others" (Hobson and Hobson 2008, p. 79). Even more explicitly, one argues that children "may index an intersubjective sense of the social partner as someone with whom experiences can be shared" (Venezia et al. 2004, p. 404). Or one can claim that for an infant "to be able to share is to be able to consider one's own mental states as mutually and overtly known to a partner" (Tirassa et al. 2006, p. 207). Barresi and Moore (2004) try to prevent such a misapprehension:

... in the context of an interaction about this common activity, the infant does not initially represent this activity as involving independent actions of self and other. Instead, at this early phase in development, the sources of information are not yet distinguished as originating from distinct individuals ... So in our account, it is fundamentally an understanding of shared *activity*, not one of understanding that self and other, as *distinct agents*, share in an activity. (Barresi and Moore 2004, p. 99, my italics)

Müller and Carpendale (2004) are explicit on this point: "At this developmental level, infant and caregiver may share knowledge without the infant being aware of the fact that knowledge is shared" (p. 222). The ascription of shared-ness, Müller and Carpendale observe "occurs from the outside point of view of another observer and does not appropriately characterize the infant's point of view" (p. 222).

A notable example of the inadequacy of the linguistic means for describing the undifferentiated self-other phenomenon is the Piagetian notion of 'egocentrism'. This type of misunderstanding is, unfortunately, not uncommon. Below, I will comment on two examples of such misunderstanding.

1.3 The Misunderstanding of Piaget's Notion of Egocentrism

In his criticism of Piaget, Perner (1991) refers to Piaget's research on spatial-perceptual perspective-taking. To investigate children's perspective-taking abilities, Piaget constructed the so-called 'three-mountain task' (Piaget and Inhelder 1956). In accomplishing it, children have to define how a perceptual display of three mountains would change, depending on the change in the viewer's position. Perner refers to a range of empirical studies that, in Perner's view (and contrary to Piaget's claims), did not show the children's egocentric preferences for *their own* view, but instead, their preferences for a "good picture of the mountains" (p. 260). That is, the picture selected by the children would represent all three mountains "regardless of whether it depicts their own view or not" (p. 261). For this reason, Perner concludes: "Traditional evidence for egocentrism remains ambiguous with respect to whether children take their own view (egocentrism) ... as absolute" (p. 261).

This conclusion displays a crucial misunderstanding of Piagetian thought. Egocentrism, according to Piaget, is the “distortion of reality to satisfy the activity and point of view of the individual” (Piaget 1962, p. 285, fn. 1). This distortion makes the child experience ‘her’ point of view as privileged in the sense of being *ubiquitous*.⁶ That is, independently of which point of view the egocentric child is occupied with at any given moment, that view is still her own unique, egocentric view. We can think of this as if the egocentric child in her mind walks around a visual display and notices how different it looks from different stationary vantage points. This does not imply, though, that the child understands the different vantage points as belonging to different subjects. The outside observer may, nevertheless, interpret the test results as the child’s ability to take what, *for the observer*, would be the different (subjects’) points of view. This is indeed, what happens in Perner’s reading of Piaget. In Perner’s reading the child takes different people’s points of view into consideration and, after comparing them, prefers a point of view that is recognized by the researcher as “not the child’s own.”

Piaget emphasized:

Far from helping the subject to distinguish between his own and other view-points, the egocentric attitude tends to encourage him to accept it without question as the only one possible. (Piaget and Inhelder 1956, p. 194)

To turn to Perner’s (1991) interpretation of Piaget (cf. above), here is his reading of the same passage. Note that Perner, in quoting Piaget, omits the first part of the sentence:

The egocentric attitude tends to encourage him [the child] to accept it [his own view] without question as the only one possible. (Piaget and Inhelder 1956, p. 194, in Perner 1991, p. 259)

By omitting the first part of the sentence and by inserting his own square brackets, especially those that explains ‘it’ as ‘his own view’, Perner distorts the initial Piagetian thought. This Pernerian interpretation of Piaget suggests that different points of view are considered by the egocentric child who then decides that his own point of view has a privileged status. On the contrary, according to Piaget egocentrism prevents the child from being able to see his view as *his view*; egocentrism “when self-conscious, is no longer ego-centrism” (Piaget 1959, p. 268). Hence egocentrism *excludes* that the child can “... accept ... *his own view* ... as the only one possible.” On the basis of his reading of Piaget, Perner (1991) summarizes: “Recent experimental evidence suggests that egocentrism of this kind is largely a myth” (p. 257).

A possible contributing factor in the above misreading of Piaget can be that Piaget’s theoretical elaborations are interpreted in the context of our adult understanding of egocentrism. I will highlight this point by quoting a recent study of children’s perspective-taking abilities. Here is how Southgate (2019) characterizes her own account:

⁶ I put the word ‘her’ in quotation marks for, strictly speaking, it is not yet ‘hers’ or anyone else’s point of view. The egocentric child is not yet capable of differentiating between herself and the social environment – this is the very essence of the phenomenon of egocentrism.

This account is clearly at odds with the natural and dominant view that children begin life as egocentric beings that need to overcome their egocentric interpretation of the world. Most notably, Piaget viewed young children's cognition as being driven by egocentricity, and egocentricity was thought to be the point of departure for cognitive development (Piaget, 1926). ... However, in fact, there has been very little investigation into the extent to which infants are egocentric, perhaps because there are few theoretical positions that provide a pathway to increasing egocentricity. (Southgate 2019, p. 7)

Southgate then accounts for 18-month olds' success in the so-called mirror self-recognition test⁷ and proceeding from this suggests that egocentricity is arising "as a consequence of the emergence of self-representation and the self-perspective during the second year of life" (p. 7).

However, according to Piaget, childish egocentrism cannot increase but only *decrease* with age (Piaget 1962; Kesselring and Müller 2011).⁸ Like Perner, Southgate tends to confuse our adult understanding of egocentrism (an inclination to an excessive self-reference) with childish egocentrism (an inability to self-refer). Piaget clarified:

in daily speech, ego-centrism means referring everything back to oneself, i.e., to a conscious self, whereas, when we use the term ego-centrism, we mean the inability to differentiate between one's own point of view and other people's or between one's own activity and changes in the object. (Piaget (1962 [1926], p. 267, fn1)

These cases of misreading of Piaget are not simply a result of confusing the researcher's point of view with the child's. They are also importantly caused by the inadequacy of language due to which Piaget himself failed to clearly convey the essence of the child's undifferentiated-ness between self and other.

One might search here for a more suitable vocabulary. For example, Southgate's (2019) notion of altercentric bias (a tendency of human cognition to be biased toward the targets of others' attention) captures children's egocentric preferences (in Piaget's understanding of the term 'egocentric'). However, children's altercentric inclinations are neutral as to whether they take the other's perspective *as belonging* to the other.⁹ Therefore, I see the notion of altercentric perspective-taking as not being adequate for discussing children's meta-representational capabilities. Following Piaget, crossing the boundaries of egocentrism crucially depends on children's ability to move from perceptual (non-meta-representational, Southgate's altercentric-bias-perspective-

⁷ There are controversies surrounding the question of whether mirror self-recognition test genuinely indicates self-awareness and there is no consensus on what kind of self-recognition this test picks up. The discussion of this debated issue exceeds however the limits of this paper.

⁸ Kesselring's and Müller's (Kesselring and Müller 2011) discussion of egocentrism as a decentering process with different phases occurring at different stages of development (from "absolute egocentrism" to less or diminished egocentrism) is consistent with Piaget's basic idea, but also with the idea of different stages of self-other differentiation.

⁹ Southgate (2019) is explicit that the issue of attributing mental states and the issue of distinguishing between different levels of perspective-taking are not in focus for her investigation. Southgate does not elaborate on self-other differentiation in connection to children's abilities to ascribe mental states to others but instead (like many others) simply infers such abilities from the 18-month olds' success in the mirror self-recognition test.

taking) to conceptual (meta-representational) perspective-taking. In this context, Piagetian term ‘egocentrism’ is a more appropriate alternative for elaborating on the different developmental phases of children’s perspective-taking.

One can further suggest using the term ‘allocentric’ instead of ‘egocentric’. After all, if the child’s point of view belongs no more to herself than anyone else, then ‘allocentric’ could be an equally valid description of the child’s perspective before she has differentiated self from the other. However, my reasons for refraining from Southgate’s notion of ‘altercentric’ are applicable even here. Importantly, I do not see the Piagetian term egocentrism as ill-suited and being responsible for our difficulties in disengaging from our adult frame of reference. On the contrary, our difficulties to give a fair account of children’s self-other-undifferentiated state (which Piaget himself encountered) have rather to do with the limits of our language. Not acknowledging the ambiguity of the key concepts (such as ‘self,’ ‘other,’ ‘one’s own,’ ‘his,’ or ‘her’) involved in his discussion puts Piaget’s intended meaning at risk.

I will now further pursue the discussion of the interpretational difficulties of developmental investigation. This time I focus on children’s perspective-taking abilities and the two ways in which these abilities are employed in the false-belief task.

2 Part II. Perspective-Taking Ability, the False-Belief Test, and Egocentrism

I start by briefly recapitulating the apparent discrepancy between the false-belief-task-implications and our accumulated knowledge about children’s early development. The false-belief test is a perspective-taking test and I discuss two different types of perspective-taking that the child needs to accomplish in order to pass the test. I investigate what I call ‘subject-related’ and ‘non-subject-related’ perspective-taking abilities (the first two sections). This discussion naturally unfolds into the new reading of the false-belief test (the third section).

In Wimmer’s and Perner’s (Wimmer and Perner 1983) experimental task, the child was asked about where the other will look for an object which, unknown to this other, had been relocated. The child and the other first observed how an object – a piece of chocolate – was placed in a location – x . When the other left the room, the chocolate was moved to another location – y . The child was then asked where the other would look for the chocolate upon his return. There were two alternatives for the child to answer this question. By pointing at location y the child would “solve” the problem by falling back on her own understanding of reality (the child fails the test). By pointing at location x the child would solve the problem in a different way – the other would be seen as a carrier of a different understanding of reality (the child passes the test).

A general conclusion about self-other differentiation immediately suggests itself: as long as the apprehended ‘other’ has to have the same beliefs about the world as the child, this ‘other’ cannot be seen as fully differentiated from the child who fails the test. The puzzling question in this context is though: In what sense can children “as young as 2 to 4 years ... assess the knowledge of others and adapt their communication accordingly” (Nadig and Sedivy 2002, p. 329), when in the same age span they fail to solve the false-belief task and hence fail to recognize the beliefs of others?

My diagnosis of the dilemma is that there are two different types of perspective-taking that the child must accomplish in order to pass the test, namely, what I call ‘non-subject-related’ and ‘subject-related’ perspective-taking.¹⁰ Only the latter of these has to do with knowledge in the proper sense. Although distinctions between different kinds of children’s perspective-taking have been formulated (e.g., Perner et al. 2002), it has not been suggested before that the most important difference between perspectives concerns the child’s appreciation of the *other* as a *knowing subject*. I then argue that, before reaching the age of passing the false-belief test, the child’s perspective-taking ability is non-subject-related, and as such not connected to any specific subject. To elaborate on this point, let us take a brief look at the current state of knowledge about children’s perspective-taking abilities.

2.1 Perspective-Taking Abilities

Children’s perspective-taking abilities is a rapidly expanding research area, addressing a variety of interrelated questions subsumed under the overall aim of apprehending when and under what circumstances children begin to take and understand perspectives. Children’s perspective-taking ability is discussed in connection to various social-cognitive skills (Yeunga et al. 2019) and is often assessed in terms of children’s ability to cooperate and empathize with others (e.g., Farrant 2015; Khu et al. 2018; Li et al. 2019). Perspective-taking can further be evaluated in relation to theory of mind capabilities and autism (e.g., Gould et al. 2011; Kimhi 2014). Researchers can talk about dyadic and prosocial perspective-taking and then find it useful to distinguish between visual, cognitive, and affective perspective-taking (e.g., Imuta et al. 2016). Much of the research in the area builds on certain important findings of discrepancies in children’s perspective-taking performances. It is a well-known fact today that children already in their second year of life can understand what is seen or not seen from different points of view. However, it is also well-known that, until they are about 4 years old, children repeatedly fail to figure out how the *same object* would look from different points of view.

So, there is an extensive body of research in the area. However my aim here is not to give an overview of this research but to pay close attention to the last-mentioned discrepancy concerning visual perspective-taking. It has led researchers to hypothesize two different cognitive levels of children’s knowledge about what is seen. At the less advanced level – Level 1 – mastered by the age of 2 years, the child can infer what is seen and not seen from different points of view. At the more advanced level – Level 2 – reached around age 4, the child acquires the additional insight that the same object could be seen differently from different points of view (Masangkay et al. 1974; Flavell 1974; Flavell et al. 1981).

Another way to distinguish different aspects of children’s perspective-taking is in terms of “*switching perspectives* (taking different perspectives at different times) and *confronting perspectives* (representing two perspectives simultaneously; understanding that there are different perspectives)” (Perner et al. 2002, p. 1466, italics in the original).

¹⁰ There are some parallels concerning this distinction with the study of Kampis et al. (2013). In investigating 10 month-olds’ apprehension of others’ preferential choices Kampis and colleagues suggested distinguishing children’s “person-specific” from their “person-independent” (or “object-centered”) preferences.

In accord with the Level 1 task achievements, Perner and colleagues could observe that children can switch perspectives “more or less from the time they start building up a larger vocabulary in the second year of life” (p. 1466). In contrast, the ability to confront different perspectives emerges around four years and “underlies the co-emergence of success” (p. 1466) in such undertakings as false-belief tasks, alternative-naming tasks and appearance-reality tasks.

Perner et al. (2002) pointed out the essential difference between the two types of perspective-taking: the truth-incompatibility of the conditions in the confronting task (e.g., ‘the chocolate is in location x’ and ‘the chocolate is in location y’) and the truth-compatibility in the switching-points-of-view task (e.g., ‘it is cold and raining’ taken as uttered in Salzburg and ‘it is hot and sunny’ taken as uttered in Philadelphia). Note, though, that in the latter case two essentially truth-incompatible conditions – ‘it is cold and raining’ and ‘it is hot and sunny’ – are transformed into truth-compatible ones when relativized to different places (Salzburg and Philadelphia, respectively).

Let us look at the compatibility-incompatibility distinction in relation to the false-belief test.¹¹ The truth-incompatible conditions ‘the chocolate is in location x’ and ‘the chocolate is in location y’, or (only) ‘smarties are in the box’ and (only) ‘pencils are in the box’, pose no problem for the child when stated as control questions referring to *two non-simultaneous events* in the child’s encounter with the world. What allows the child to pass the control requirements is that the truth-incompatible conditions are relativized to two different points in time. However, the false-belief task procedure forces the child to consider truth-incompatible alternatives. The peculiarity of this enterprise is that the only possible way for the child to pass the test is by *relativizing the incompatible condition to a different subject* (see further below). A natural hypothesis in this context is that the inability to solve the false-belief task is attributable to the fact that the child is not yet cognitively qualified to relativize along this different-subject path.

2.2 A Non-Subject-Related Perspective-Taking Ability

The idea of children’s non-subject-related perspective-taking ability has been discussed or at least intimated in a number of research settings. Already Masangkay et al. (1974), in the context of their initial suggestion to distinguish between the two levels of the child’s perspective-taking ability, pointed out that “alternative cognitive mechanisms [i.e., non-subject-related ones] certainly cannot be ruled out” (p. 359). In identifying what is seen on one side of a card – a dog – as opposed to what is seen on the other – a cat – (Level 1 tasks), the child could understand the question that specifies a *subject*: “what do *I* see” (p. 359, italics in the original) as a question about what is depicted on the one or other side of the card. In like manner, Masangkay and colleagues noted: “the child may have interpreted *E*’s [experimenter’s] eye position exactly as he did her manual pointing – as indications only

¹¹ A conceptual note is in order here. The expressions “switching perspectives” and “taking perspectives” are often used interchangeably in the literature and then contrasted with the ability to “confront perspectives.” To prevent misunderstanding I distinguish between ‘switching’ and ‘confronting’ perspectives according to the above line of reasoning, while using the notion of ‘perspective-taking’ as referring to both these actions.

of *what (object) is there*, in that position, rather than as indications of what is currently being seen by *another*" (pp. 359–360, my italics). However, after writing: "While we readily admit the cogency of these alternative explanations" (p. 360), the researchers right away abandon the idea of children's subject-less performances on the basis of "some informal evidence" (see pp. 359–360).

An emphasis on the *object* of shared attention and on children's ignorance of the *another-subject* aspect of their early perspectival experiences is also present in more recent research. Moll and Tomasello (2012) and Moll et al. (2013) note, for instance, the relative simplicity of accomplishing the switching task: "The children did not need to spontaneously state how the *other* perceived or conceived of something," but "[i]t was sufficient for them to determine the *goal, target, or referent* of another's performative act..." (Moll et al. 2013, p. 652, my italics). That is, the other subject was *not an object* of the child's attention. A similar conclusion is also drawn in the study of Kamps et al. (2013). In social situations "infants do not encode the perspectives of other agents as person-specific sources of knowledge." Instead, "they learn about the object, rather than the agent's disposition towards that object" (p. 232).

The idea that accomplishing a switching task does not require a subject-related perspective-taking finds support in other studies. In a more elaborated false-belief test procedure adapted for autistic children (Sally and Anne test), the researchers (Baron-Cohen et al. 1985) required that two additional control conditions be fulfilled before the child could proceed to answer a critical false-belief question. The child had to tell where the hidden object – a marble – was now (a reality question) and where it had been placed earlier (a memory question). The two control questions were: "Where is the marble really?" and "Where was the marble in the beginning?" (Baron-Cohen et al. 1985, p. 41). *All* autistic children correctly answered the control questions. The potentially confronting conditions – 'the marble is in location *x*' and 'the marble is in location *y*' – were here presented in terms of two sequential events and did not require the children to take a stance concerning the *other's* knowledge. The same children failed to correctly answer the following false-belief question: "Where will Sally look for her marble?" Now the question about the marble's location required an opinion concerning the *other's* knowledge. Answering the false-belief question required that the same confronting conditions that just a moment ago were relativized to two sequential events now be relativized to a different subject. Or differently put, the false-belief task in the Sally and Anne test requires the child to engage in subject-related perspective-taking.

In this context, there are some interesting parallels to Gopnik's and Astington's (Gopnik and Astington 1988) "representational change" task, Smarties. Note though that three year-olds' difficulties in attributing to their past selves the false belief that the tube contained pencils could not be blamed on a failure to relativize the content of the tube to different points of time. Children were never asked about the tube's contents at two different occasions. The false-belief question was designed to stress children's account of *their own* mental states (pp. 29–30). Children's problems in the Smarties task were due to their inability for meta-representation. Whether the question about *their own state of mind* concerned the past or the present event, the three year-olds could not yet engage in subject-related perspective-taking.

2.3 A New Reading of the False-Belief Test

Distinguishing between two qualitatively different types of perspective-taking – non-subject related and subject-related – can give us insight into the children’s uneven accomplishments in different experimental settings. Non-subject related perspective-taking is already developed in the second year of life and is manifested in the child’s ability to switch between different vantage points in exploring the world around her. This switching proceeds egocentrically, i.e., without connection to any specific subject. In contrast, subject-related perspective-taking takes the other subject’s understanding into account. This ability is developed later and is expressed by the child’s capability of relativizing confronting conditions to different subjects.

In this theoretical framework the essence of the false-belief test is that besides confirming the child’s ability to move (switch) between different vantage points of view, it taxes the child’s ability to appreciate the other as a carrier of a confronting point of view. That is, the other is now acknowledged as a separate knowing, or at least believing, subject. Contrary to the usual understanding of the task as a litmus test for the child’s ability to understand *what* mental states other people are in, the proposed reading instead focuses on the apprehension of the other as a separate subject that *can have mental states of her own* – surely a *precondition* for mentalizing.

I refer to the suggested reading of the false-belief test as an ‘epistemic’ but also as a Piagetian reading, and I will now explain why.

The idea of a non-subject-related perspective-taking is closely related to the Piagetian notion of egocentrism. According to Piaget, alongside the child’s inability to completely dissociate herself from the other, the egocentric state implies her inability to dissociate herself from *any* object because, during the act of acquiring knowledge about it, “the subject does not know himself and, in turning towards the object, is unable to uncentre himself” (Piaget 1959, p. 274). For decentration to take place, the egocentric child needs to *disengage* herself from her immersion with the object (be it human or non-human) and, in taking a new kind of perspective, reflectively attend to (and become cognizant about) the object in focus. As long as this disengagement is not achieved the object, e.g., the other, is not yet an object of her *epistemic* interest.

Hence, the emergence of what I call an ‘epistemic relation’ – the relation that holds when a subject takes something as an object of possible knowledge – can be understood in the context of the Piagetian decentration process. When the object is another person, this process requires a disengagement between the child and the other person. It allows the child to see the other both as *an object of epistemic interest* and as *a separate knowing subject*. When applied to perspective-taking abilities, the notion of an epistemic relation captures something that goes beyond the notions of confronting or incompatible conditions (cf. section 2.1). It requires *a special solution to the incompatibility problem* – the relativization needs to be achieved not in relation to a time or a place, but in relation to a subject (separated from the child).

This is precisely what is tested by the false-belief procedure: either the child’s viewpoint on reality is also the other’s viewpoint (the non-differentiated self-other stage) or the other’s *different* view on reality is acknowledged (the differentiated self-other stage). It is only in the latter case that the other is acknowledged as an epistemically separate mental being. By “epistemically separate mental being” I mean here a

being whose view on reality (as a knowing or a believing subject) can be accepted by the child as being different from the actual state of affairs (as apprehended by the child).

In short, the child's dissociation (disengagement, disconnection) from an object (which can be another person) is crucial for her ability to cross the boundaries of her egocentrism. By passing the false-belief test the child exhibits proof of being disconnected from other persons. She shows this by accepting the other persons' beliefs, desires and intentions as *their* beliefs, desires and intentions. Before the discovery of the other, the other person was inhabiting the child's egocentric world on the child's terms. Such a discovery will finally allow the child to relativize confronting conditions to different subjects.

The standard reading of the false-belief test does not regard as primary the child's understanding of the other as an object of knowledge, and hence, in the sense discussed here, is not an 'epistemic reading'. It does not distinguish children's subject-related abilities from their non-subject-related attitudes. Or differently, it does not distinguish children's epistemic attitudes from their non-epistemic, egocentric attitudes. As a consequence, the standard reading of the test makes it natural to speak about epistemic abilities of very young children shown by children's non-verbal false-belief performances. An important problem with this is that children's early mindreading capacities are discussed without clarifying in what sense the mentalizing infant distinguishes *as an other* the other person about whom she is supposed to mentalize. A Piagetian reading of the false-belief test challenges the standard view on this point.

3 Part III. Some Consequences of the Proposed Reading of the False-Belief Test

To claim that children lack a true self-other differentiation before being able to give the right answers in standard false-belief tasks is obviously highly controversial. To further support the claim of such a late self-other differentiation would require reinterpreting many empirical findings that in today's research are taken as supporting the mainstream story. Very briefly I will exemplify some important cases of such a reinterpretation and start by reflecting on how the Piagetian idea of childish egocentrism is usually applied in various developmental findings (sec. 3.1). I then reflect on developmental precursors to children's mature subject-related perspective taking (sec. 3.2), and address some possible objections to my account (sec. 3.3). One important issue permeates the discussion that follows. It concerns children's early mentalizing abilities. These abilities are often seen as children's false-belief competences long before their success in the verbal false-belief task. I will address this issue in various places in my argument below and, in concluding, will make a more general comment as to why the claim that children have an implicit false-belief understanding remains unfounded (sec. 3.4).

3.1 The Piagetian Idea of Childish Egocentrism and some Developmental Findings

The questions of perspective-taking, self-other differentiation and egocentrism are closely related. According to Piaget, egocentrism is a state of un-differentiation between the other and the self (Piaget 1959). Due to this undifferentiation, the child cannot yet connect happenings around her to any specifically identified subjects, and so

lives without any rational system of reference or co-ordination between different points of view. The only point of view that the child takes is one that she is not conscious of: the child's own. For this reason, egocentrism, as Piaget pointed out is "a kind of systematic and unconscious illusion, an illusion of perspective" (p. 268). This illusion includes the fact that other people around the child think and experience the world in the very same way as the child. This understanding of Piaget's notion of egocentrism accords with the proposed reading of the false-belief test. That is, before passing the false-belief test, the child's perspective-switching abilities do not yet include any relations to an epistemically different other; in this way, the child's early perspective-taking abilities are indeed *egocentric*.

Importantly, the child's ability to see something or, e.g., to desire something (Repacholi and Gopnik 1997) from different points of view is not yet a sure sign of her ability to *dissociate* herself from the person that falls into her focus. The non-differentiated other can still suggest a different vantage point to switch to, so that the child understands *what* is seen or desired from that different viewpoint. While the child then takes a perspective that is, in fact, that of the other, she does not understand it *as* the perspective of the other, because no such other is yet an object for her. Here are Moll and Tomasello's (2012) reflections on that matter:

... young children's inability to confront perspectives becomes apparent only under specific circumstances but passes unnoticed in many of the regular everyday interactions, which are mainly grounded in perspective taking [i.e. switching perspectives]. For example, even infants understand that an adult asking them for a piece of food may want broccoli, not crackers (even though the infants themselves have the opposite preference, Repacholi and Gopnik 1997) or that a person striving for an empty box wants to retrieve an object whose removal she failed to witness (Buttelmann et al. 2009). Young children and even infants can engage in pretend play and act as if an object were something it is actually not. But again, no confrontation [here] ... is necessary. (Moll and Tomasello 2012, p. 1131)

The suggested distinction between subject-related and non-subject-related perspective-taking can explain the sequenced developmental acquisition described above. Children's assessments of intentions and desires that differ between people do not require a confrontational stance. Instead, the child egocentrically switches between different points of view and announces what is intended or desired from the vantage points in question.¹² This explains children's successful accomplishments in these matters long before their success in false-belief tasks.

¹² Compare this to Ward et al.'s (2019) idea of "spontaneous vicarious perception." Ward and colleagues empirically investigated prior work proposals claiming that fluently switching between one's own and the other person's perspectives leads to computing what others see: the content of another person's viewpoint maps onto one's own perceptual system and can stand in for one's own perception.

Together these findings provide direct evidence that humans are endowed with a mechanism that allows them to rapidly and spontaneously derive [not only *what* but also] *how* others see an object. The (inferred) view of the other person takes a quasi-perceptual form that can stand in for one's own sensory input. (Ward et al., p. 878, italics mine).

It is not enough just to rely on what seems to be rather obvious, namely, that *some* kind of self-other discrimination is at work in many different kinds of social interactions with much younger children. As, for example, when children address another person with a question (Deborah et al. 2004), or when they point things out informatively for another to attend to (Liszkowski et al. 2004). Or, as in one study (Prat and Bryant 1990) investigating the seeing-knowing relation, when 3-year-olds seemed to be aware that an agent who had looked inside a box knew its content, while another agent who had not peaked inside did not. So there are manifold ways by which we seem to notice the child's appreciation of the other. Nonetheless, in taking these routes, a researcher's conclusion about a significantly earlier onset of the ability to hold self and other apart neglects the child's still predominating egocentricity. To succeed in the tasks just mentioned the egocentric child neither can nor need to take any stance toward the *other* as a subject with her own view on the world.

To put it in a different way, let me quote two studies. Theorizing about attributing mental states to others Colle et al. (2008) postulate a "who" system responsible for distinguishing between the self and the other's perspective on shared representation. The emergence of this system is connected, Colle and colleagues argue, to the advent of triadic sharing: 9-month-olds' abilities in social referencing "indicate that infants recognize others as separate entities" (p. 345). In discussing their view on children's mindreading and shared-ness, Tirassa et al. (2006) likewise hold the view that in the second half of the first year, children "begin to understand that other people may not see what they themselves see, and thus become capable of distinguishing their own visual perspective from that of others" (p. 210). The view that children's perspective-switching indicates their mindreading abilities naturally affects Tirassa's and colleagues' conception of egocentrism but also their idea of sharedness (see sec. 1.2). Colle and colleagues write:

In social referencing behaviours, children show that they are able to distinguish their own from other's perspective. The ability to switch from one perspective to another is an important precursor of [children's] communication ... (Colle et al. 2008, p. 345).

However, switching perspectives needs to be distinguished from confronting perspectives (Perner et al. 2002, cf. Moll and Tomasello 2012, above). When Colle et al., Tirassa et al. with several others do not consider self-other differentiation in connection to children's different ways of perspective-taking, egocentric *switching* can be interpreted as if children appreciated the mental states of other subjects.

One might suggest here distinguishing between different experiential conditions. Tests for capturing children's adaptive social behavior in situations where others have false beliefs should be distinguished from the conditions for assessing the children's explicit understanding of others as subjects. This is correct but not sufficient. As we have seen, children's switching abilities that explain their adaptive social behavior can mislead researchers to conclusions about infants' theory-of-mind capabilities. Note the ambiguous vocabulary when talking about children's early *sensitivity to others' beliefs* in switching conditions. The ambiguity concerns not only the expression "sensitivity to others" but also "belief."

The word “belief” is not yet applicable to the young child. In my opinion, belief (and knowledge) are meta-representational states or acts. Without the ability of meta-representation, young children cannot yet apprehend various intentions expressed from different points of view as *beliefs*, let alone as *others’* beliefs.¹³ Infants’ sensitivity to intentions and inclinations that (from an adult point of view) *actually belong* to others, does not yet indicate that these intentions and inclinations *are taken by the infant as belonging* to others. Showing the former does not suffice for showing the latter. The latter is first accomplished at the age of passing the false-belief task and acquiring the ability of meta-representation, which consequently signifies the child’s ability to recognize these intentions and inclinations in terms of others’ beliefs. Thus, the wording “infants are sensitive to others’ beliefs” tacitly suggests a certain structuring of developmental phenomena that are not yet organized in the way typically described by adults (see sec. 1.2).

The young child’s sensitivity to a desire or an inclination expressed from the viewpoint suggested by the other is surely a sign of earlier pathways of appreciation of that other (see sec. 3.2); but this is an appreciation without yet an understanding the other person as the owner of the inclination in question. This insight has an important bearing on the notion of implicit false-belief competencies (see sec. 3.3 and 3.4).

When the question of self-other differentiation is not problematized in the way discussed here one may easily understand the child’s early perspective-taking performances concerning Level 1 tasks as thoroughly non-egocentric. So, for example, Flavell (1992, p. 120) observes: “The 3-year-olds had no difficulty whatever in looking at the cat, say, but nonegocentrically reporting that the experimenter sees the dog.” From this, the conclusion follows that “the child’s percept cognition is fundamentally nonegocentric when dealing with Level 1, ‘what-is-seen’ type problems” (p. 122). Or more generally: “Thus, the research evidence indicates that children of this age are nonegocentric showers ... nonegocentric hidiers ... and nonegocentric percept assessors ...” (p. 122).

However, the nature of the children’s understanding of others when manipulating different subject-less perspectives (Level 1 tasks) can be explicitly tested in the false-belief task (Level 2 task). For example, the study of Hogrefe et al. (1986) investigated children’s performances in the false-belief task in relation to Level 1 and Level 2 of children’s visual perceptual inferences. In summarizing their findings Hogrefe and colleagues noted that the “other’s” knowledge, while first being correctly identified (Level 1 task), was then immediately neglected when it contradicted the child’s (Level 2 or false-belief task):

Yet, when asked to specify what the *other* thought [Level 2 task] was in the box, they *reverted to egocentrism and attributed their own knowledge about the real content to the other*, even though in response to the just preceding Ignorance Question [Level 1 task] they correctly denied that the other possessed this very knowledge. (Hogrefe et al. 1986, p. 578, my italics).

¹³ Furthermore, as I see it, children’s meta-representational abilities are not primarily connected with the ability of children to conceptualize their experiences but with their ability to self-refer, which in turn is coupled with their ability to have epistemic relations with their surroundings. I elaborate on this issue in another paper but, in the present context, cannot develop this point in the detail that it deserves.

In relation to this observation I would like to add that the so-called *other's* knowledge (first recognized but later denied) was for the child *never* the *other's*, even if it appeared as such from the researchers' point of view. However, Hogrefe's and his colleagues' description implies that children, before they "reverted to egocentrism," could think non-egocentrically, i.e., in terms of different subjects. There are, as I see it, two sources for this dubious idea. The first is the researchers' interpretational difficulties in keeping their own understanding of the matter apart from the child's actual development. The second source is an incomplete grasp of the Piagetian notion of egocentrism.

Let me now speculate about the early signs of gradual self-other differentiation and discuss them in connection to children's perspective-taking abilities.

3.2 Perspective-Switching as a Precursor to Subject-Related Perspective-Taking

In children's early dyadic interactions, traces of others' minds can be seen in their abilities to discriminate perceptually between self-related and other-related stimuli (sec. 1.1). The subsequent development of triadic interactions will eventually lead to the development of the first perspective-taking ability. Perspective-switching ability is then developed in the second year of life and is widely used in various contexts of joint attention. This switching activity can explain infants' and toddlers' sensitive attitudes towards others but can also be seen as developmental precursor to subject-related perspective taking. Let me take an example. A group of researchers (Moll et al. 2016, 2017) demonstrated that 3- as well as 2.5-year-olds show more expressions of suspense (such as lip-biting) when they observe an agent approach a box due to a false belief as opposed to situations of true belief or ignorance. How can this kind of data be explained in terms of an egocentric, undifferentiated self-other state?

One might think here that toddlers either (i) adopt the point of view of the mistaken agent and therefore expect to find whatever the agent believes to be in the box, or (ii) project their knowledge onto the agent and therefore anticipate that the agent is fully aware of the current content of the box. None of these cases should create any suspense in the child. Note though that in the condition of joint attention the child can freely switch between different points of view. This switching activity makes the perspectives of those who share them "merge into each other" and "co-exist through a common world" (Merleau-Ponty 1962, p. 317). In Kruegel's (Krueger 2013, p. 517) words: "phenomenal states at this stage of our ontogeny are potentially capable of being entered into, shaped by, and shared with others." As I see it, in shared attention the other appears for the egocentric child as a very special and unique *intentional tool* by virtue of which the referent, the goal, or the target can be reached (or emotionally charged/discharged in various internalized affective situations).

Now, what happens when the children in the Moll et al. (2016, 2017) studies encounter the fact that the mistaken other is no longer a participant in joint attention and does not keep track of the object in focus? This *disruption* of joint attention will imply that some parts of the triadic system no longer cohere with the rest. For an autistic child this is no problem. However, a normally developed child will be left in a kind of distress, unable to participate in person-to-person-toward-a-shared-world relatedness. In these circumstances helping, comforting or sharing behavior could be children's attempts to restore connectedness and diminish the distress in the entire system. Children's expressions of suspense can then be a sign of their early sensitivity

to the clashing of different points of view: the viewpoint of reality and that of the mistaken agent, the points of view between which they switch. In this sense, their lip-biting or brow-furrowing may be a sign of an early appreciation of the traces of another's mind (a sign of the gradual development of self-other differentiation). However, children's facial expressions originating from their perspective-switching activity cannot allow us to claim without reservations, as Moll et al. (2017) do, that 2.5-year-olds "understand false beliefs" and "affectively anticipate the 'rude awakening'" (p. 114) of the misinformed agent.

3.3 Pragmatic and Executive-Functioning Accounts

The fact that there is the strong correlation between verbal false-belief performance and executive ability can be seen as a challenge to my account. Executive ability here encompasses such heterogeneous skills as self-regulation, planning, distribution of attention, inference and inhibitory control (see e.g., Zelazo et al. 1997). One can argue that due to their executive deficits very young children cannot explicitly manifest their tacit false-belief understanding. To be more nuanced, there are two varieties of executive accounts in research on theory-of-mind development: emergence accounts and expression accounts (Moses 2001). According to expression accounts, certain pre-existing theory-of-mind capabilities are already in place even before children's success in the explicit false-belief test. Children's difficulties in channeling their already present knowledge of others' mind (the others' false belief) is explained by their failing to inhibit the salient aspects of the real world (what the children know is true). However, according to emergence accounts, a certain development of executive ability is needed for the child to assess the mental states of the other. As Carlson et al. (2002) put it, "without some capacity to disengage themselves from salient aspects of the real world ... [children] would be entirely unable to consider the possibility of alternative perspectives on that world" (p. 74).

In my view, such a capacity (or executive ability) enables the child to see the possibility of a confronting view about the world. Hence, my framework is in accord with emergence accounts while in conflict with expression accounts. However, as I will argue, expression accounts cannot be properly supported. The central supposition of these accounts is that children's performances in false-belief tasks are affected by their inhibition deficits. To illuminate this idea researchers often evoke the experimental design of deception (e.g., Carlson et al. 1998; Hala and Russell 2001). The idea is that when administered in the context of deceit the false-belief test will help children to over-ride their reality bias and so will be more sensitive. For, "[I]f children perform deceptive act in order to change the behavior of another person via a manipulation of his or her mental states, they can be said to be recruiting a 'theory of mind'" (Hala and Russell 2001, p. 112).

Hala and Russell's characterization of deception agrees with how human deception is usually understood: "Human deception mainly relies on manipulating others' beliefs; in order to achieve this, a deceiver must recognize that others have beliefs, and that these may differ from his or her own" (Semple and McComb 1996 p. 436). However, there are controversies surrounding deception, pretense and false-belief understanding. Without taking a stand on the debated issue of whether deceptive methods provide a more sensitive test for false-belief understanding or merely increase false positives by

prompting children to understand the mistaken search for the hidden object, I would like to note the following. Pretense, deceit and manipulation are widespread in the animal world. Moreover, the pivotal question in social cognition is whether non-human animals, when deceiving, are manipulating the minds of the others or merely their behavior (Semple and McComb 1996). This reflection is germane to the discussion here.

Non-human animals and human infants are non-self-reflective beings. An egocentric deceiver has no understanding of *her own* inclinations and therefore cannot recognize that others have inclinations that differ from her own. Envisage here a behavior of an egocentric child who, in hiding, covers her head and imagines ‘herself’ (see fn. 6) as not being seen. This performance can indeed be effective in manipulating the behavior of the child’s parent but not the mental state of that parent (in the desired way). Deception is widely used in the animal world ranging from spiders (Jackson and Wilcox 1990) and birds (Ristau 1991) to non-human primates. Children’s early engagement in playful situations of deceit and their enjoying with plots of trickery in children’s stories and fairy tales are also well documented. Manipulation and deceit can well be seen as the major forces in the evolution of intelligence (Whiten and Byrne 1988), but manipulating the behavior of others is not yet manipulating their beliefs. The latter requires subject-related perspective-taking while the former, as I would like to suggest, can effectively be explained by switching between different viewpoints. This switching activity can further be explained without any notion of false-belief, or of any belief whatsoever. Or differently, if deception is widely used by non-self-reflective beings then such deception and manipulation thereof is based on quite different mechanisms than the meta-cognitive self-assessments employed by human adults.

I would like to suggest that deceptive behavior in non-self-reflective beings requires at least switching between different viewpoints. To manipulate the behavior of another agent the deceiver to some extent needs to appreciate what will be experienced from the viewpoint of this agent. The child who in hiding covers her head by her naïve deceptive maneuver reveals a kind of appreciation of the other such that through the lenses of that other (coinciding with the child’s own line of sight) she is not seen.¹⁴ To substantiate their claim of children’s early mentalizing abilities, expressions accounts need first to show that children’s deceptive behavior is apt to manipulate others’ beliefs and not just their behavior.

There have been other attempts to support the claim of children’s early mentalizing abilities. For example, it has been suggested that young children may be spontaneously motivated to help the mistaken agent find her object and therefore point to the actual location of the object (Buttelmann et al. 2009). It has also been proposed that children’s failure in the false-belief test is due to a ‘referential bias’: the experimenter does not only refer to the target object in the test, but also actively shares with the child the correct epistemic perspective on the actual location of the object (Westra and Carruthers 2017; Helming et al. 2014, 2016). Under these interpretations subject-

¹⁴ This behavior is another piece of evidence in favor of a gradual emergence of a self-other distinction but also a sign of a not yet properly developed ability to self-refer. Generally, children’s switching perspective capabilities indicate that a vantage point suggested by the other is appreciated as a *mental*, *perceptual* (but not yet *epistemic*) point (see also fn. 12). At some stage of the child’s normal development, these mental vantage points will become subject-related (i.e., epistemic), and whatever is originated from these points of view will be seen as *belonging* to other beings.

object differentiation seems to emerge earlier. However, neither of these ideas convince me. Firstly, the idea of a ‘referential bias’ squares well with children’s egocentric preferences: the children’s perspective on the actual location of the object merges with the experimenter’s. By switching to the experimenter’s perspective the child fails the test. This is precisely my point; the egocentric child cannot succeed in the test while exclusively relying on her switching perspectives behavior.

The idea of ‘helping’ heuristics implies that the child understands the protagonist’s false belief and, knowing the right answer, helps the mistaken agent. In contrast to research relying on paradigms of violation-of-expectation and anticipatory looking, helping heuristics seems to provide an importantly different kind of evidence for early mindreading. By taking advantage of the propensity of children’s to help others with their problems the suggested procedure (Buttelmann et al. 2009) used a more active behavioral response to assess children mindreading abilities. The results of Buttelmann’s and colleagues’ assessment seemed to show that 18-month olds could successfully help an agent in a way that signified some sensitivity to the agent’s belief. This presents a challenge to my account.

The test procedure in Buttelmann’s and colleagues’ study included two conditions, what the researchers called true-belief and false-belief conditions. During both these conditions the child and an assisting experimenter (E1) watched how another experimenter (E2) put toy in a box A. In the true-belief condition E2 stays in the room and witnesses how E1 moves the toy from box A into a new box, B. In the false-belief condition, E2 leaves the room and is ignorant of the replacement of the toy into a new location. During the test phase where the child, E1 and E2 are present, E2 struggles to open the now empty and locked box A and the child is encouraged by E1 to help E2. In both test conditions infants helped E2 but in different ways. In the true-belief condition most of the 18-month-olds opened box A (the empty box). In the false-belief condition most of the 18-month-olds opened box B and revealed the toy to E2.

Buttelmann and colleagues interpret their findings as evidence showing early belief understanding: in the true-belief condition, infants could infer that the adult’s attempt to get into the empty box was not to extract the toy and therefore they helped to open the empty box. In contrast, in the false-belief condition, the infants understood the adult’s false belief and, while wanting to help, retrieved the hidden toy from the box B. How could children’s dissimilar helping behavior be explained in my framework? Before answering this question let us look at some criticism directed toward the Buttelmann’s and colleagues’ study.

The central point of this criticism (e.g., Allen 2015; Priewasser et al. 2018) was that the two testing conditions were in certain aspects importantly different. While in the true-belief condition E2 watches as a bystander how the toy is moved to a new location, in the false-belief condition E1 plays a trick on the absent E2. Playing a trick and secretly hiding the toy constitutes an independent variable that differs between the two conditions. This variable not only makes the toy particularly salient but also creates an expectation that in return the adult will look for the toy (Allen 2015). Priewasser et al. (2018) mention other confounding factors: children at this age have already developed an acute sense of ownership and the context of playing a trick could induce the feeling that the toy belonged to E2 and that E2 would take a great interest in finding the toy. Children’s distinct helping pattern in

true- and false-belief conditions may hence not be based on belief reasoning, Priewasser et al. (2018) argues.

To test their hypothesis Priewasser et al. (2018) slightly modified the test procedure used in Buttelmann's and colleagues' study. Their conclusion was that 18-month olds helping behavior was not based on any concern for the adult's mental states but instead on the *purpose* or *goal* of the other person's action (see sec. 2.2 but also sec. 3.2 above). This conclusion is in accord with my interpretation of Buttelmann's and colleagues' findings: both the false- and true-belief conditions invited infants to engage in non-subject related perspective taking. By switching to the perspective suggested by E2's stance and by taking into account different goals and aims introduced by the dissimilar settings of the experiment the infants showed a different pattern of helping behavior (see Moll and Tomasello 2012, p. 1131, quoted in sec. 3.1).

Allen (2015) argues:

That is, Buttelmann et al. pursued the laudable goal of providing new empirical evidence in an effort to begin to resolve the infant false-belief debate. However, such a goal involves ruling out the possibility of alternative non-mentalistic interpretations for successful performance. False-belief tasks tend to be empirically stronger tests of mindreading because they seem to require children to reason about the adult's false beliefs in order to succeed. If success on the helping task can plausibly be accomplished without reasoning about the adult's false-beliefs, then the task is empirically inadequate to differentiate between alternative interpretations. (Allen 2015, p. 66)

and concludes: "Theoretically, Buttelmann et al. take a mindreading framework for granted and are thus committed to the same type of 'rich' interpolations that have accompanied infant looking procedures more broadly" (p. 63).

This is the key point of my criticism concerning different studies of children's early mentalising abilities. Without any clear procedure for assessing infants' understanding of another person as *an other*, researchers rely on instances of indirect evidence. However, this kind of evidence cannot substantiate far-reaching conclusions about children's metacognitive abilities and their false-belief understanding. I will now proceed to a more general remark about the rather extensive debate on children's early false-belief abilities.

3.4 Children's Early Mentalizing Abilities

A notable number of empirical studies claim to have produced evidence for early implicit false-belief understanding. The central question under investigation has been how infants as young as 15- and even 13-months-old (Onishi and Baillargeon 2005), 17-months-old (Southgate et al. 2010), 18- and 24-months-old (e.g., Buttelmann et al. 2009; Knudsen and Liszkowski 2012) and 2.5-years-old (e.g., He et al. 2012) could show an apparent ability to understand the content of the others' false-beliefs. In contrast to explicit linguistic formulations and evaluations of the false-belief question (the explicit, classical theory-of-mind-test procedure), the implicit false-belief

understanding of much younger children is assessed indirectly, for example, by sophisticated eye-tracking equipment.

Longer looking at the successful action than at the erroneous action in cases of false belief is interpreted as children being surprised about a successful action when the actor has a false belief. These data indicate sensitivity to the *protagonist's belief* as early as 14 or 15 months. (Perner 2010, p. 252, my italics)

The interpretation above is about a very interesting empirical observation – differences in the child's looking time that seem to capture some underlying discrepancy. This discrepancy is usually understood as being about *what* is seen and *what* is expected to be seen – an instance of the so-called violation-of-expectation paradigm. I do not object this understanding. However, the eye-tracking procedure lacks any direct means of establishing the infant's understanding of the *otherness* of the other. The child's amusement about *what* is seen cannot support a more far-reaching conclusion about the child's sensitivity as to *whom* the different vantage point belongs. An obvious example that springs to mind is the Smarties task (Gopnik and Astington 1988). A much older child, whose expectations are violated, and who is surprised to see pencils instead of sweets in the Smarties tube, need not give the correct answer to the false-belief question and need not yet be able to mentalize about the other person. Importantly, I do not argue against the violation-of-expectation paradigm as such. I just want to note that to claim that the infant is sensitive to *what it takes to be the protagonist's belief* there needs to be more compelling reasons than references to what can be interpreted as the infant's surprise. Falck et al. (2014) suggested, for example, that in violation-of-expectation-based false-belief tasks, differences in looking time can be seen as a result of infants' tendency to find interest in what others attend to (the phenomenon of "interest contagion"). Such a low-level explanation does not need to assume that the infant is viewing the other as acting on his or her belief.

Heyes' (2014) meta-analysis is interesting in this context. In providing a detailed review of more than 20 experiments investigating infants' implicit mentalizing abilities Heyes suggests an alternative "low-level novelty" explanation model. In contrast to the usual false-belief-mentalizing terminology the new frame of understanding explains infants' reactions in terms of their ascriptions of low-level features (colors, shapes, sounds) to *objects*, rather than in terms of their ascriptions of high-level features (true and false beliefs) to *agents*. Heyes then argues that the suggested low-level interpretation can be applied equally to all published studies to date on early false-belief understanding.

Generally, any discussion of theory-of-mind capabilities (either implicit or explicit) first has to secure the child's apprehension of the other as *other* before making further inferences about the child's mentalizing ability. Until this is done, to raise the question of an implicit theory-of-mind will be misguided. The child who cannot yet cognitively, or epistemically, differentiate between herself and the other *cannot* be seen as having a theory-of-mind about *another* person. A similar conclusion is also drawn by Heyes (2014): "*If the low-level novelty hypothesis is correct, research on false belief in infancy currently falls short of demonstrating that infants have even an implicit theory of mind*" (p. 647, italics in the original). In a sense, Heyes' interpretation only goes

halfway since it assumes that the infants do ascribe features to objects, and not only react to these features. Nevertheless, her argument supports my general point.

Again, my point is a methodological one. If one wants to claim that the child has a theory about the *other's* mind, one first needs to check whether this child can differentiate between herself and the other, and in what this differentiation consists. Until there is an *other* (apprehended as distinguished from oneself) no attribution-talk is warranted.

To summarize this section, some researchers on early false-belief understanding simply adopt the language of a higher-order meta-representational explanation without giving any reasons for their choice (e.g., Kovács et al. 2010, p. 1832). Others take it for granted that children from early infancy can track and update beliefs attributed to others. Proceeding from this one can then elaborate on underlying processes that make such tracking and updating possible (e.g., Kovács 2016). Still others argue for more parsimonious interpretations without the vocabulary of higher-order mental terms such as 'belief' and 'knowledge' (e.g., Falck et al. 2014; Kampis et al. 2013; Heyes 2014).

Generally, as far as I can judge, at least in the contemporary state of research, the implicit false-belief paradigms cannot secure the status of the other person as other.

3.5 Concluding Remarks

One of the main concerns of this paper has been to discuss some interpretational weaknesses in the scientific research on young children's development. The problem of scientific interpretation concerns a discrepancy between what is evident for the external observer and what is actually the case for the child's perception and understanding of the situation. This discrepancy between two levels of scientific inquiry seems to be a major source of the interpretational complexities in studying the child's earliest stages.

To some extent, researchers on child development are aware of the existence of the interpretational traps under the surface of their scientific efforts. Nonetheless there is, to my knowledge, no systematic effort in the recent literature to elaborate on these issues. This paper was an attempt in that direction. The investigation has shown that a more suitable terminology can help us understand the nature of that eminently appropriate test for self-other differentiation, the false-belief test. The proposed Piagetian reading offered here focuses on the child's different perspective-takings and on her ability to epistemically differentiate between herself and another person.

"In developmental psychology, the construct of theory of mind (ToM) grew out of the Piagetian notion of perspective taking, which is the ability to take another person's point of view" (Imuta et al. 2016, p. 1192). This is correct, but Piaget also emphasized that the child's ability to take another person's point of view presupposes her differentiation from that other person. The robust findings of the false-belief task (Wellman et al. 2001) indicate that this differentiation is not yet fully accomplished by 4 year-olds who fail the test. This further implies that before their success in false-belief settings, children's perspective-taking is egocentric and accomplished without epistemic differentiation between oneself and the other.

My suggestion for understanding young children's uneven performances in perspective-taking was to consider a non-subject-related perspective-taking. This kind of perspective-taking is manifested in children switching between different

viewpoints without taking into account to whom (i.e., to what subject) these viewpoints belong.

The Piagetian notion of egocentrism is often radically misunderstood. This presumably is the main reason why its true relevance for the current debate on perspective-taking and self-other differentiation has been underappreciated. In the context of the proposed Piagetian reading, it was possible to conclude along the following two lines.

First, concerning children's perspective-taking ability: before passing the false-belief test or equivalent tests, young children's perspective-taking abilities do not include any appreciation of a knowing or believing other. At this early level of their development, children seem instead to be well equipped to handle different perspectives by mentally moving (switching) between different vantage points and, at each of these points, applying their own – that is, the only one possible – egocentric perspective. The abilities of these children to switch perspectives may be compared to walking around a visual display and noticing how different it looks from different vantage points.

Second, concerning the question of self-other differentiation: the child who is not yet mature enough to pass the false-belief test acknowledges the other only insofar as different but not yet confronting) points of view are suggested. That is, the other is not yet in an epistemic sense an *other*, but only someone who inhabits the child's egocentric world on the child's own terms. In this sense the other's points of view are not really the *other's* but still the *child's*. Because of this, speculations about children's early mentalizing abilities (before they succeed in passing the classical false-belief test) lack the necessary foundation. Proper theorizing about an early mentalizing-like stage would require elaborating on different stages of self-other differentiation. A legitimate question in this context is: In what sense do children, who are not yet mature enough to pass the explicit false-belief task, understand the other's role in the implicit false-belief arrangements? The project of answering this question needs to be pursued by paying careful attention to the interpretational difficulties discussed in this article.

Methodological concerns are of primary importance in any scientific theorizing. Taken into consideration in relation to children's perspective-taking abilities, these concerns suggest a novel interpretation of a central developmental test. The new reading of the false-belief test brings with it an important critique of existing experimental and theoretical work. Undoubtedly, this critique will meet resistance. However, those who will disagree with the conclusions of these pages will be confronted with a challenge. They will need to present a different solution of the inconsistency between their view and the robust findings of the false-belief test about children's ability to apprehend themselves as separate from others.

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