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Shared Intentionality and the Cooperative Evolutionary Hypothesis

Glenda Satne & Alessandro Salice

Abstract

One important application of theories of collective intentionality concerns the evolution of social understanding and even of human thinking (Tomasello 2014). A promising idea behind this approach is the Cooperative Evolutionary Hypothesis (CEH), namely, the idea that humans' capacity for social cooperation is at the heart of their ability to understand others' mental states and behavior, leading to an explanation of how humans came to share thoughts and language. However, some of the most popular defenses of CEH face important problems. In this paper, we take Tomasello's account (2016, 2014, 2008) as a leading example of the CEH which faces such insurmountable problems. In particular, we argue that Tomasello's analysis of cooperation and spontaneous help is problematic. We locate a source of such issues in the assumption that the right account of joint action and simple forms of shared intentionality is that which is offered by Bratman's theory of shared intentions. The second part of the article proposes and defends an alternative framework for understanding shared intentionality that can help substantiate CEH.

Introduction

One important application of theories of collective intentionality concerns the explanation of the evolution of social understanding and for some even of human thinking (Tomasello 2014).

A promising idea behind this approach is the *Cooperative Evolutionary Hypothesis* (CEH), namely, the idea that humans' capacity for social cooperation is at the heart of their ability to understand others' mental states and behavior, leading to an explanation of how humans came to share thoughts and language.

In this vein, Tomasello (2014, Tomasello et al. 2005, 1999), has argued that a tendency to cooperate, coupled with an ability for socio-cultural learning, leads to the emergence of human specific sophisticated forms of cognition including the ability to entrain representations that are objectively valid. Thus, Tomasello claims that:

“the amazing suite of cognitive skills and products displayed by modern humans is the result of some sort of species-unique mode or modes of cultural transmission. The evidence [for this] [...] is overwhelming” (Tomasello 1999, 4).

Furthermore, following CEH, Tomasello argues that,

“[Thinking] is a solitary activity all right, but on an instrument made by others for that general purpose, after years of playing with and learning from other practitioners [...]. Human thinking is individual improvisation enmeshed in a socio-cultural matrix” (Tomasello 2014:1)

In his account of CEH, Tomasello (2014) distinguishes two forms of social intentionality that correspond to a two-step evolutionary story. Both are forms of interaction and collaboration that are said to have paved the way for the emergence of human specific forms of cognition.

First there is *joint intentionality*. This form of intentionality characterizes short-lived spatially and temporally located second-personal interactions between particular individuals. These are small-scale collaborations, triadic interactions in which the individuals involved share goals and jointly attend to situations and objects in the environment (Tomasello 2014, 48). According to Tomasello, this form of intentionality does not involve any grasp of objectivity in the sense of universal validity on the part of the interacting agents, rather individuals involved in these kinds of collaborations have a perspectival understanding of the world that encompasses a ‘sense’ or understanding of other perspectives towards the same objects. Second, there is *collective intentionality*. This kind of intentionality is at play when agents engage in large-scale collaboration. This form of engagement between agents goes beyond the here and now characteristic of joint intentionality. It involves the establishing—or the background presence of an already established—*cultural common ground* (e.g., institutions, conventions, and so on). This kind of intentionality, according to Tomasello, makes an “agent-neutral point of view” available to the agent (Tomasello 2014, 5/122). The point of view of a universal group that, in this framework, equates to the ability to grasp an objectively valid point of view.

Thus, in Tomasello’s view the notion of joint intentionality pretends to describe the set of abilities that an organism is able to entertain without yet being capable of manipulating truth-functional representations of others and the world. It comprises mechanisms for social cooperation that enable individual learning and work in conjunction with mechanisms for the social inheritance of culturally evolved devices. When it comes to giving an account of joint intentionality Tomasello refers to the work of Bratman. Joint cooperative activities proper to joint intentionality are defined in terms of the satisfaction of Bratmanian conditions for joint intentional action (Tomasello 2014, 38ff). Accordingly, Tomasello states that three conditions for joint intentional action are sufficient for joint intentionality, i.e.:

If you and I are agents, and J is a goal, then:

- (1) I must have the goal of doing J together with you,
- (2) you must have the goal of doing J together with me,

and

(3) we must have “mutual knowledge, or common ground, that we both know each other’s goals”

(Tomasello 2014: 38).

Condition (3) involves meta-representations of other people’s mental states, and hence higher order attitudes. It is to be noted that not every interaction of this kind will involve meta-representations, because there may be sufficient information in the situation available for the agents to know that they both want to J. In such cases, the agents know their mutual goals because they stand on ‘common ground.’ Nevertheless, Tomasello argues that a capacity for recursive mindreading needs to be presupposed on the part of the agents to make sense of the very possibility of them engaging in this kind of interaction. He argues that in conflicting situations, we draw back to recursive reasoning, showing that our capacity of knowing that we both want to J has “an underlying recursive structure” (Tomasello 2014, 38; also 2008). Thus, mechanisms for understanding the perspective of another agent towards the common goal and the situation need to be presupposed. Tomasello argues further that understanding the perspective of a partner in joint action requires simulating her abductive inferences ahead of time in order to anticipate how one might be understood by the other (Tomasello 2014: 94). Thus, agents capable of this sort of interaction have cognitive capacities that underpin recursive inferences, simulations, ongoing self-monitoring and meta-representations of self and other (Tomasello 2014:5, 9, 143). In this view, social cognition is part and parcel of joint intentionality involving both simulation theory (ST) and theory-theory (TT) of mind.

Tomasello’s particular attempt to advance the CEH faces several problems (see Satne 2016). In this paper, we focus on one strand of such problems. Specifically, we argue that Tomasello et al.’s (Tomasello 2014, Warneken & Tomasello, 2006, 2007) analysis of cooperation and spontaneous help is problematic. The root of the issue lies in assuming that the right account of joint action and simple forms of shared intentionality is given by Bratman’s theory of shared intentions. We conclude by proposing an alternative framework for understanding

shared intentionality that has the resources for overcoming these difficulties, fits well with empirical data, and can help substantiate CEH.

We proceed as follows. The first section outlines Tomasello's (Warneken & Tomasello 2006, 2007; Tomasello 2016) account of helping and cooperative behavior and its Bratmanian assumptions. The second section presents and discusses important problems of the view. The third puts forward of an alternative account, "a (minimal) collective view", that fits Warneken & Tomasello's empirical data while also dissolving the conundrums that affect their view. Finally, section four responds to the challenges and assesses the advantages and potential downsides of both views.

I. Tomasello's account of helping and cooperative behavior & its Bratmanian assumptions

Tomasello (2014, 2016) argues that children's early cognitive development provides important evidence for drawing hypotheses about the emergence and evolutionary trajectory of human cognitive capacities.¹ Consequently, studies focusing on early collaborative activities in children can be thought to provide important hints into the evolution of human cognitive capacities and potentially contribute to an account which would fit the CEH. But is Tomasello's account of cooperation a plausible way of substantiating the CEH? We think not. To see why we will focus on a series of experiments (and corresponding conclusions) of Tomasello's research on early helping and cooperative behavior in young children.

Warneken and Tomasello (2006, 2007) have studied joint action and helping behavior in young children. Such studies investigate the child's early understanding of shared intentions by focusing on two different kinds of behavior prominent in children between 14 and 24 months: 1. the child's tendency to help others achieve their goals, which is manifested in their engagement in further pursuing the incomplete actions of adults; 2. The child's ability

¹ Tomasello endorses a more controversial thesis, the idea that 'ontogeny recapitulates phylogeny,' illustrated by his endorsement of the two-step intentionality theory for both ontogeny and phylogeny (see the final section of this paper for an illustrative quote). While we are not alone in thinking that this thesis is too strong (see Gould 1977 and Satne 2016), the claim that the developmental path of a cognitive capacity provides some evidence and constraints on its evolutionary trajectory is quite uncontroversial.

to engage in shared cooperative activities, where the roles of each agent's actions are complementary and where all the interactors (children and adults) are pursuing the same goal together (Warneken & Tomasello 2006, 2007). In this view, only the latter is an example of shared intentionality and coincides in development with what we defined in the previous section as 'joint intentionality'.

According to Warneken & Tomasello, the first kind of cooperative behavior, i.e. helping behavior, is to be found in children starting at around 14 months of age. The experiments that test this kind of behavior are as follows: several tasks were performed in front of children where the experimenters encountered some kind of hindrance—his/her marker fell while drawing, a clothespin was dropped while hanging towels, a spoon accidentally fell into a box on top of which the experimenter's teacup was placed. In each case, the experimenter expressed annoyance when this happened ("Oops! I dropped my marker", etc.). This was contrasted with control conditions where the experimenter did not seem to care about what happened, or where she/he intentionally caused the hindrance (e.g., intentionally throwing the spoon into the box after stirring the tea). While in the former cases the children spontaneously engaged in the activity by helping the experimenter (by picking up the clothespin or marker, etc.), in the latter they did not. According to the authors, the outcomes of the experiments showed that young children have an altruistic tendency to act upon others' incomplete or impeded goals, and a correlated rudimentary capacity to understand someone else's intentional actions. Importantly, in their view, this is not yet a case of shared intentionality, because even if children are acting to achieve another person's goal, they are not coordinating their activities with the adult.

The second kind of behavior they tested is the one that, according to these researchers, can properly be called "joint intentional activity." As we will see below, such experiments are meant to satisfy Bratman's conditions for shared intentional activity.

In similar experiments, Warneken and Tomasello (2006) analyzed the behavior of children between 18 and 24 months. There, two agents (the child and the experimenter) must perform complementary roles in order to achieve a joint goal, e.g., pulling opposite ends of a tube to

retrieve stickers that are hidden inside or placing a ball into a tube and catching it from the other side. It was shown that children as young as 18 months can successfully deal with these sorts of joint problem-solving tasks. When comparing both age groups, it was observed that this sort of activity is consistently and spontaneously carried out by 18- to 24-month-old children and becomes more skillfully and expertly performed over time. Moreover, in carrying out these experiments, the researchers found that children over 18 months of age consistently protest (verbally or non-verbally) if the adult disengages before the shared activity is completed and, significantly, that such protesting still arises even if the activity is successfully completed and the goal attained. In addition, they also observed a tendency in the children to repeat the action even when it was completed successfully. In their view, this showed that, in so doing the children were not pursuing an individual goal (e.g. get the ball) but rather that they were interested in the shared activity as such.

In summarizing their results, Warneken and Tomasello characterize spontaneous helping behavior as an example of individual intentionality: contributing to another person's goal manifests an understanding of the other person's goal directed behavior, but it is not yet a case of sharing a goal with another. This comes as no surprise since they explicitly state that shared intentional activity is to be understood in terms of Bratman's analysis of shared intentionality (see Warneken et al, 2007: 291; see also Tomasello 2014:38,40).

According to Bratman, (1992) agents that engage in joint action have a number of individual and interlocked intentions that steer, guide, and monitor their joint activity. Given Jones and Jane and an action *J*—say, building a house—the conditions are that:

(1) the agents pursue *interdependent* goals—that is, Jones intends that Jane and Jones *J* together and Jane intends that Jones and Jane *J* together.

(2) the agents pursue the goal in an *intentional and non-coercive* way, that is, Jones intends that Jane and Jones *J* together in accordance with and partly because of Jane's intention as in (1) and Jane intends that Jones and Jane *J* together in accordance with and partly because of Jones's intention as in (1).

(3) the agents *intend that their strategies towards the goal mesh together*: Jones intends that Jane and Jones *J* together in accordance with and partly because of meshing sub-plans of (1) and Jane intends that Jones and Jane *J* together in accordance with and partly because of meshing sub-plans of (1).

(4) all the conditions are *common knowledge* for Jones and Jane.

(5) among the agents there is public *mutual responsiveness* that tracks the goal.

(6) there is a *commitment to mutual help* and support among the agents.

In Bratman's framework, a goal *J* can be said to be shared *distributively*. Distributive goals are defined by Butterfill (2012) in the following way:

"An outcome *O* is a distributive goal of two or more agents' actions if, first, *O* is one to which each agent's actions are individually directed and, second, each agent's actions are related to the outcome in a way that it is possible for all of them together to succeed in bringing about *O*" (Butterfill 2012: 849).

Since the conditions spelled out by Bratman's account of joint cooperative activity are not fulfilled in the first group of experiments in which there are no complementary roles for the action to be achieved, Warneken & Tomasello treat helping behavior in young children as a precursor to the kind of shared activity that is exhibited later, when children engage with adults in coordinating activities, what they take to be 'joint intentionality' proper. Accordingly, they characterize spontaneous helping behavior as an example of individual intentionality: contributing to another person's goal manifests an understanding of the other person's goal-directed behavior, but it is not yet a case of sharing a goal with another, as the conditions spelled out by Bratman are not fulfilled. The authors conclude that helping behavior in young children is a precursor to the kind of shared activity that is exhibited when

they later engage with adults in coordinating activities, such as in the experiments above. Nevertheless, as we argue below, the specific features of the analysis they provide of shared intentional activity and helping behavior cast doubt on whether their conclusion really follows from the studies. Several features of children's behavior are not really explained by the Bratmanian model they use. Moreover, using such a model to explain children's engagement in shared activity leads to what could be taken as important shortcomings in their analysis.

II. *Challenges for Tomasello's account of helping behaviour and cooperation in young children*

Continuity and overlap

While children seem to move naturally from helping others complete their actions (starting at 14 months) to engaging in joint action at 18 months, in Tomasello framework there is no motivation to see these two kinds of behavior as interconnected in any important way. Warneken & Tomasello themselves conclude that:

“Intraindividual comparisons of infants' performance on helping and cooperation [tasks] revealed no straightforward associations between the two suggesting that these activities differ in important ways” (W&T 2007: 291, see also 291-292).

But this is because the account frames these two kinds of behavior as *a fortiori* independent. On the one hand, tests aimed at studying 14-month-old children helping adults complete their actions are conducted in scenarios where there aren't any individual motivations for the children to pursue the specific actions the adult is engaging with (this is something that the experiments explicitly control for), something that is a precondition for engaging in Bratmanian shared cooperative activities, as stated in condition (1) above—i.e., both individuals need to have the goal of J-ing together. Conversely, children's engagement in joint cooperative activities of a Bratmanian sort is completely independent of their tendency to help adults. This is because one can engage in Bratmanian cooperative activities without

being motivated to help the other interactors. It is true that as a consequence of engaging in this sort of cooperative activity individuals *become* committed to offering support to each other—this is condition (6) above—but this is so *insofar and only insofar* as they are pursuing the distributively joint goal at issue. This is different from being naturally and generally motivated to help one another, i.e. a kind of helping behavior that is mainly independent of having the same goals as another. Thus, in Warneken and Tomasello's framework helping behavior and shared cooperative activities come out as concomitant types of behavior and not internally articulated developments. For this reason, helping behavior in children requires a completely different explanation on this model. Warneken and Tomasello (2006, 2007) attempt to offer such explanation by postulating the existence of a psychologically innate altruistic tendency to care for others and provide support. But even if humans are born with an innate tendency to help others, postulating such a natural altruistic tendency does not explain it. The problem is that within this framework, helping and cooperative behavior cannot explain one another: an innate tendency to help and support does not explain children's engagement in cooperative activities à la Bratman and engaging in Bratmanian cooperative activities does not explain or predict altruistic tendencies. For this reason, CEH becomes a mere postulate unable to account for the early development of shared intentionality in young children.

Explaining the evidence

Warneken & Tomasello consider as important evidence of the child's ability to share goals in a Bratmanian sense the fact that she wants to repeat the action and protest if the adult disengages both before the action is completed or after it has been successfully completed. Crucially, according to the authors, this behavior suggests that children are not acting individually in such cases, but that they understand their partner's key contribution in what they are pursuing. Yet, granted that the fact that they want to repeat the cooperative sequence even when completed successfully could be considered as evidence of the special engagement and interest children have in these activities, the evidence is not very congenial with Bratman's conception of joint action and is not predicted by his theory. According to a Bratmanian understanding of shared cooperative activity, there would be no motivation to

continue trying to reengage a partner when an action has been successfully completed. The key driving force of each individual's behavior is the goal they are pursuing—i.e., acting to achieve X (say to retrieve the ball from the tube) by means of the other's intention to do the same. But when the ball is retrieved, the goal is successfully reached and, arguably, there is no reason to continue to do it. Following a Bratmanian understanding of shared intentionality one should predict that children would protest only until their individual goal is achieved and not after successfully achieving it. In this framework, once the goal is attained there is no inherent motivation to protest or to attempt to reengage the partner.

Cognitive demandingness

The third problem also relates to Bratman's conception of shared intentional action. The problem is that if we use, as Warneken & Tomasello do, Bratman's model for understanding shared intentionality in infants—what Tomasello (2014) calls 'joint intentionality,' which is the first possible form of shared intentionality—we need to attribute to children capable of participating in joint action an understanding of the concept of intention as applied to oneself and others and common knowledge of one's own intentions as well as those of the others. As we explained in the previous section this involves commitment to the agent's being able to entertain higher-order nested propositional attitudes. Arguably, this is not a reasonable demand on the abilities required for young children to engage in joint action, not only because they engage in this sort of activity quite early, but crucially because engaging in some shared activities and joint actions may be essential for acquiring such a sophisticated understanding of the notion of intention and of other persons as agents (see Butterfill 2012, Satne under review). For this reason, many have argued (Tollefsen 2005, Brownell et al. 2006, Michael et al. 2014, Zahavi & Satne 2015) that Bratman's conditions for shared intentional activity are too cognitively demanding to be attributed to young children. The claim coming from many, and despite the differences in their views, is that we need a simplified account of joint action if we want to make sense of young children's ability to engage in shared activities with others.

To illustrate this concern, consider in more detail condition (4) in Bratman's account, which corresponds to Tomasello's condition (3) above, the common knowledge condition. As

explained above, Tomasello argues that common knowledge can be had in virtue of the fact that both the agents stand on common ground, but this is in turn grounded on an inferential recursive capacity of mindreading (see: Tomasello 2014, 38). Both in Tomasello's and Bratman's views, this means that each agent engaged in shared cooperative activity is required not only to believe that the partner agent has certain intentions, but also to believe that each agent believes that each agent has certain intentions. If construed along these lines, common knowledge relies on the agent's capacity to attribute beliefs to other individuals about one's beliefs (cf. Tollefsen 2005). Attributing beliefs to other individuals requires a theory of mind (ToM), and traditional research in social cognition suggests that children younger than 4 only have limited ToM-abilities.² It should be said, however, that this conclusion is currently a matter of heated debate. For example, other ToM tests (so called "indirect" tests, see: Low & Perner 2012) suggest that some ToM abilities surface much earlier. Also, Rubio-Fernández & Geurts (2013) suggest that children of 2.5 years of age have already acquired ToM-abilities.³ Importantly, the problem here does not hang on the issue of when children develop some version of a ToM, for the recursivity of the beliefs required for common knowledge (their ranging over other beliefs, that is) would still represent an insurmountable challenge for young children (see Carpenter & Liebal 2012: 165). If this psychological evidence is taken seriously, then Bratman's theory is not able to explain joint action among preschool age children⁴. As Pacherie (2013: 1825) remarks, however, this conclusion is not particularly threatening for Bratman's account given that the explicit aim of this account is to identify a set of sufficient, but not necessary, conditions for shared intentionality. On the other hand, this is threatening for Tomasello and Warneken since they commit to Bratman's framework to explain children early abilities concerning shared

² This claim relies on children's alleged inability to pass the false belief test before the age of 4 (cf. Wellman et al. (2001); also see Wimmer & Perner (1983))

³ See Gallagher (2015) for critical discussion of the relevant tests, whether they evince ToM capacities, and, if so, of what kind.

⁴ These arguments leave open the possibility for other psychological mechanisms to explain joint action in young children. Pacherie (2013), for example, proposes that joint action in young children is explained by their ability to group identify. However, the success of Pacherie's account depends on how the psychological notion of group identification is understood. On her view, group identification presupposes the ability to adopt the group's perspective. Because of this assumption, Salice & Miyazono (under review), argue that Pacherie's theory may also turn out to be too cognitively demanding for the purposes of explaining the first and very early forms of social interaction among children.

intentionality.

In the next section, we sketch out an alternative account of ‘minimal shared intentionality’ which we argue can address the three difficulties presented above: (i) showing that there is an internal articulation between helping behavior and shared intentionality that can help substantiate a full-fledged CEH, (ii) explaining protest and reengagement targeted at the participation of others in joint activities, (iii) providing a less cognitively demanding explanation of the ability to cooperate with others than Tomasello’s Bratmanian model. Taking all of these results together we argue that the approach to minimal shared intentionality here advocated is a plausible candidate for substantiating CEH, a task that is left open to be further pursued in the future.

III. *Evolving collective intentionality*

We argue in this section that the challenges faced by Tomasello’s account of cooperation might be overcome by an altogether different conception of shared intentionality, one in which collaboration and help flow from the structure of the shared activity without the need to postulate any further factor, such as an innate altruistic tendency to support one another.

Instead of distinguishing two forms of shared intentionality—one joint and one collective—as Tomasello et al. do, we propose to understand shared intentionality as collective from the outset, having different stages of development (see Satne 2016). Collective or we-intentionality is the capacity to take part in a group or a ‘we’. According to this view, individuals display collective intentionality when they are part of a group that sets itself to do something. Our hypothesis is that the ability to adapt and interact with others by pursuing shared goals is prior to joint intentionality which involves representing mental states and other’s perspectives, and that collaboration is based on a sense of engagement and group membership that starts to develop quite early in infancy (see Hobson 2002; Reddy 2015, see Over & Carpenter 2009, Buttelmann et al. 2012).⁵

⁵ As noted above, Pacherie provides a collective view of early joint action. For our reservations about the prospects of such an account for substantiating CEH, see fn. 4 above.

This view takes as its point of departure the apparent fact that children are immersed in social practices from the beginning of their lives, e.g. interacting with family members, care-givers, and peers, including siblings and other social group or family members. It has been claimed that children shift towards a “socio-centric mode of reasoning” by the age of 3 (cf. Dunham & Emory 2014), when they begin to encode group membership and to display in-group favoritism. But recent research has traced the emergence of sociality back even earlier. Although it is a matter of debate whether these findings illustrate genuine understanding of group membership (cf. Buttelmann et al. 2013: 427), Kinzler and colleagues (2011) have found that preschoolers, when learning new information, trust native-accented speakers more than speakers with a different accent. Similarly, Buttelmann and colleagues (2013) show that, from the age of 14 months, children imitate those speaking in their native language (in-group members) more faithfully than those speaking a foreign language (out-group members). 18-month-old infants helping behavior is the target of Over and Carpenter (2009) experiments. In a series of experiments they show that the mere hint of affiliation dramatically increases prosocial behavior in infants that age. In these experiments, 18-month-old infants helped a person in need more often, and more spontaneously, when primed with photographs evoking affiliation (images human like puppets interacting) of than when primed with photographs evoking individuality (images human like puppets not interacting or alone). These experiments suggest that there is a strong correlation between group membership and helping from very early age.

Following the experimental research, we propose that the form of intentionality that precedes and grounds what Tomasello calls ‘collective intentionality’ is a more primitive, minimal, but already collective form of intentionality. This is a kind of social intentionality that can be thought to underlie and support the development of the full-fledged kind that involves conventions, language, institutions, and objectively valid contents. It is a primitive kind of group behavior that is not preceded by ‘joint intentionality’ in Tomasello’s sense, but rather is integrated with more basic forms of joint action. A form of ‘minimal’ collective intentionality that designates special forms of group acting and feeling that are displayed in jointly acting. Such early forms of joint action do not require representations of others’ mental states from the outset, but spring from common background norms and habits that in

turn provide a platform for the emergence of representational capacities. We surmise that this minimal variety of collective intentionality is associated with a minimal and unsophisticated understanding of others' mentality and agency. Furthermore, the minimal form of collective intentionality at issue is basic also in the sense that it does not depend on taking part of already stable groups and might well take place on a one-to-one basis, e.g. when children interact in dyads with care-givers. Thus, minimal collective intentionality characterizes interactions that are particularly pervasive in the first years of life, namely, second-personal relations between particular individuals that interact with one another in intentional activities through which they pursue collective goals.⁶

Thus, the proposed account provides a way of substantiating CEH by committing to the idea of an evolving capacity for collective intentionality. This view proposes that social interaction begins without the exercise of perspective-taking and that with time and exposure to multiple sources of social learning and training a more developed form of collective intentionality—including the capacity to act and think within more complex groups—develops progressively, including those forms that involve the capacity to explicitly represent foreign perspectives. Essential to this progression is the emergence/learning of language, which is an external cultural reservoir of rules and norms, and other sorts of environmental scaffolds, in the context of which objective content would have its proper place.

Psychologically this means that the development of the capacity for collective intentionality breaks into several stages. In the case of infants, the ability to coordinate and attune to others' directed actions and reactions might suffice for making sense of a minimal capacity for collective intentionality, belonging to very simple activities in early infancy. For example, 2 to 4-month-old babies have been shown to accommodate and bodily anticipate the usual style of their care-givers pickup postures (see Reddy 2015, Reddy et al. 2013) and 6-month-old babies to bodily comply with intentional directives (including linguistic ones, Reddy 2012, 2015, see also Rochat 2015). According to the minimal collective view, what is characteristic of these forms of interaction is that each participant's role in the activity is determined and

⁶ For thorough argument for why one ought to consider second-personal interactions of this sort a form of collective intentionality, see: Satne (under review).

structured by the shared activity in which they—as a group/we/dyad—are taking part, without the children planning ahead or intellectually predicting and representing the mental states of their partners (see Satne under review).

For older children, the ability to identify with a group might be the basis for sharing more sophisticated goals with others (Rakoczy et al 2009, see Salice 2015, Salice & Miyazono under review): the ability to adopt the group perspective, enables, e.g., the formation of long-standing goals whose achievement requires complex planning, coordination through time, and presupposes the exercise of normative pressure on the individuals to provide the expected contribution (Gilbert 2014). In addition, the progression from one to the other form of collective engagement involves the scaffolding of shared intentional activities by shared norms and the exercise of guided and individual practical reasoning, thus making it possible for more sophisticated reason-guided collective behavior to emerge.

While there is much more to be said about the details of our proposed alternative view on collective intentionality (for more see Satne 2016, Satne forthcoming, Satne & Salice 2015, Hutto & Satne 2015), our aim in this paper is to show how an account of minimal collective intentionality committed to the framework just presented can address the three difficulties presented above to Tomasello's two-step account of CEH. With that aim in mind, in the following we present a sketch of the psychological mechanisms sufficient for minimal collective intentionality. Finally, we show that the collective view here advocated can provide answers to the three challenges presented to Tomasello's way of substantiating CEH.

Minimal collective intentionality in ontogeny

According to the view on minimal collective intentionality here advocated, young children have dispositions to engage in a kind of group behavior that does not require that they represent the other's perspectives on their actions.

Taking together a number of different empirical studies and psychological theories of development, in the following we describe three psychological dimensions of action and cognition that are sufficient for making sense of minimal collective intentionality in the sense

defined. Those are (i) social conformism; (ii) basic forms of spontaneous interpersonal coordination; and (3) unsophisticated forms of social cognition. All three elements are key for making sense of shared action, and social learning, leading to the emergence and development of more complex collective and social behavior. In what follows we briefly describe each.

Social conformism

“Social Conformism” describes a set of mechanisms for shaping children’s dispositions to match the behavior of other members of the community and continue to monitoring them for compliance (Haugeland 1998)⁷. This cluster of mechanisms have been studied by several researchers under different headings: viz. mechanisms for ‘mindshaping’ (Zawidzki 2012), ‘mutual adaptation’ (Kiverstein & Roepstroff 2016), ‘folk-psychological normative regulation’ (McGeer 2007, 2015), ‘in-group bias imitation’ (Buttelmann et al. 2013), ‘natural pedagogy’ (Csibra & Gergely 2009), normative enforcement (Rakoczy, Warneken & Tomasello 2008) and imitation/emulation (Tomasello 1996, 1999a; Call et al., 2005; Tomasello & Rakoczy, 2003; Tennie, Call, & Tomasello, 2009, 2012).⁸ These mechanisms of social conformity get the practice of learning and teaching off the ground and do not require individuals to purposefully comply with rules from the get-go. Instead of representing rules and others’ assessments of their actions, individuals are sensitive to others’ assessments through more minimal cognitive pathways such as emotional tuning to others’ approval and disapproval (see Satne 2014).

⁷ The core idea can be found in Haugeland (1990), who describes it in the following way: “when community members behave normally, how they behave is in general directly accountable to what’s normal in their community; their dispositions have been inculcated and shaped according to those norms, and their behaviour continues to be monitored for compliance”. (Haugeland 1990: 406).

⁸ There is a debate concerning the demandingness of the cognitive machinery required to make sense of this set of social conformism capacities (see: Tomasello 1999; Rakoczy, Warneken & Tomasello 2008; Csibra & Gergely 2009; and for a critical discussion, Satne 2014). Here for reasons of space we advocate the minimal view without further discussing this issue.

Coordination

Coordination refers to the individuals' capacity to follow others and conform to group behavior (Pacherie 2013, 2015). Several studies have shown an innate tendency in humans to coordinate their own bodily movements and, progressively, more sophisticated activities with others (see Knoblich et al. 2011). Studies from interactive dynamics also call attention to these mechanisms of coordination or spontaneous coping (see De Jaegher, Di Paolo & Gallagher 2007 for a review). This capacity is crucial for understanding how joint coordinated activities are possible from a very young age and to understand their development into more complex coordinated activities later in life when combined with other, more sophisticated skills, including those involved complex planning.

Basic forms of social cognition

Early forms of social cognition play a key role in accounting for the ability to engage in minimal collective intentionality, for example, in explaining how children are able to identify others' approval or disapproval by tuning to someone else's reactions. Instead of having recourse to TT and ST or a combination of the two, as Tomasello does, this proposal aligns itself with the phenomenological tradition and in particular with the idea that at least some mental states, like basic emotions, are directly observable (see Merleau-Ponty 1964; Zahavi 2014, Gallagher 2001, 2015). Importantly, this tradition has challenged the idea of representation as the building block of cognition. Both enactivist accounts of cognition (see e.g. Noë 2006, Gallagher 2017, Varela, Thompson, and Rosch 1991, and Hutto & Myin 2014) and phenomenological ones (Merleau-Ponty 1964; Gallagher 2001, 2015), reject the idea that what one is doing when cognizing the world and other subjects within it, is building up representations of objects and states of affairs. Rather, such accounts understand (basic) cognition in extensively, relational, interactive, and non-representational terms. According to this framework, cognition is not based on internal representations but conceived in terms of different sensorimotor responses to affordances in the environment, that is, in regard to

our possible actions or the possible actions of others in a given situation (Gibson 1979)⁹. Some views—e.g., the radical enactive approach (Hutto & Myin 2014, 2017)—hold that some forms of cognition are representational but deny that this is the case with root and, especially, early forms of cognition. In particular, they claim that representational cognition is built upon and depends on the mastery of special linguistic practices of claim-making (Hutto & Satne 2015, Hutto & Myin 2014, 2017). While we won't provide further arguments in favor of these accounts of cognition in this paper, we surmise that an account of the early forms of basic social cognition can appeal to recognitional dispositional capacities instead of representational ones to account for the developmental and evolutionary trajectories of human cognitive abilities.¹⁰ In the same vein, some studies in developmental psychology have provided evidence that face-to-face encounters involve direct perceptual understanding of others' emotions and intentionally directed actions (Reddy et al. 2013, Rochat 2003, 2015) and it has been argued that these do not need to implicate the explicit or implicit use of representations, inferences, or simulations (Gallagher 2001, Zahavi 2008, Hutto 2014, Reddy et al. 2013, Zahavi 2014, Satne 2014). When it comes to substantiating the CEH, the perceptual account, briefly sketched out here, has some interesting advantages vis-à-vis ST and TT models of social cognition. It does not presuppose that either simulations of theoretical inferences are necessary for primitive forms of social cognition to emerge, allowing for a cognitively undemanding account of basic social cognition, and thus provides an important tool for the minimal collective view to account for very early forms of social interaction in babies as young as two months of age (Reddy 2008, Rochat / Striano 1999)

IV. Tackling the problems of Tomasello's account of helping and shared intentionality in young children

⁹ See Reed (1991) for a non-representational account of social affordances and their developmental and evolutionary trajectories.

¹⁰ For a view on minimal cognitive capacities based on Millikan's concept of push-me pull-you representations (PPRs), see: Salice & Miyazono (under review). This account can be thought to be compatible with radical enactive views as long as one agrees with Millikan that the organismic responses at issue are intentional—i.e. extensional—and not intensional (for detailed discussion, see: Hutto & Myin, forthcoming; and Hutto & Satne 2015).

Continuous development

According to the collective view outlined above, helping behavior in children is intrinsically articulated to their gradually developing understanding of themselves as part of a group or a ‘we’. In the view here advocated, children would engage in helping behavior insofar as they are contributing to a shared goal, a goal they have insofar as they belong to a group (maybe a dyad) to which they see the adult as also belonging. Thus, this sort of helping behavior is thought to be intrinsically related to a root ability to share goals with others, i.e. the capacity for minimal collective intentionality .

As was said above, Warneken & Tomasello (2007) claim that: “‘infants’ performance on helping and cooperation tasks revealed *no straightforward associations* between the two suggesting that these activities differ in important ways” (29, our emphasis). Contrariwise, the proposed collective view, developed according to a less cognitively demanding model of shared intentionality, claims that shared intentionality is based on a sense of involvement and membership that starts to develop quite early in infancy (see Hobson 2002; Reddy 2015). Our view may thus contribute to putting at the center of the empirical research on child social behavior the allegedly existent links between helping and cooperation—e.g. help could be measured with respect to in-group and out-group scenarios (see Over & Carpenter 2009, for an example). If help is proven to be modulated by group membership from very early on in development, then the emergence of social cooperation and group life in phylogeny—concerning whose existence there is solid scientific agreement—might contribute to an explanation of its emergence as well as its central role in modern human lives.

Explaining protest and reengaging behavior

Allowing for collective action in early infancy allows us to make sense of children’s complaining and reengaging behavior: the interest in redoing the actions targeted in Warneken & Tomasello’s experiments would not be tied to the achievement of one’s individual goal. It would be intrinsically tied to a sense of contributing to a collective goal—and to a developing interest in belonging and being recognized as a member of a group. In the collective view, these are the motivations of protest and reengagement behavior in

children found in Warneken & Tomasello's studies. But repetition is key in this account of minimal collective intentionality, for group membership is built up through manifold and repetitive interactions with others.

Cognitive demandingness

The collective view puts the possibility on the table that the ability to adjust to the behavior of groups or another individual is what makes it possible for children to start engaging in more and more complex shared activities with others. It claims that this sort of engagement might be possible without representing the intentional states of others and argues that coordination and attunement might suffice for very simple tasks in early infancy. For older children, the ability to identify with a group and follow shared norms may offer a new platform for them to share collective goals with others. Both the former and the latter abilities may be thought to be cognitively less demanding than Bratman's conditions on joint action, being based on emotional sharing and imitation (Satne 2014, Buttelmann et al. 2012, Over and Carpenter 2009), rather than perspectival representations, meta-representations and complex instrumental reasoning.

In light of the foregoing observations, one might conclude that this account of minimal collective intentionality seems to offer a promising alternative to Tomasello's view concerning shared intentionality in that it allows one to make sense of the three problems that Tomasello & Warneken face. That is, it predicts and accounts for continuity between cooperation and helping, it explains and predicts the data on child helping behavior (their protesting behavior and their tendency to want to repeat the joint action), and it is a less cognitively demanding account. Thus, our alternative account seems to be a good candidate for substantiating CEH.

Adjudicating between the views

Tomasello himself has acknowledged that this proposal "has some merit" (Tomasello 2016:122), in his words:

“[...]Satne has a somewhat different proposal. Her problems with the intermediate step of joint intentionality lead her to basically try to avoid it altogether. She proposes that we should just think about children becoming enculturated into the wider group from the beginning, without any intermediary stage in which they form special kinds of relationships and engage in special kinds of activities jointly with other individuals. There is no problem in principle with this approach, and I am sure it applies to some animal species [...] And I am open to the idea that children are adapting to the group in parallel to their forming special kinds of individual relationships with others” (Ibid).

But he complains that

“It is just an empirical fact that young children are first skillful with joint intentionality before they are skillful with collective intentionality, and it seems obvious that the kinds of relationships and interactions that children have experienced with other individuals should have some effect on the way they relate to and interact with the group [...] I simply do not see how we can leave out of account the kinds of second-personal relationships that are so important to human social interaction, for example, joint commitments that are made to other individuals.[....]. And I would say that empirically it is the case that infants and young children interact in quite sophisticated ways when interacting with a single other individual, and when they are in groups they mostly simply act in parallel with others or they engage with another individual” (ibid)

Might these remarks pose a problem for the proposed strategy on how to substantiate the CEH?

As it is apparent, the point that Tomasello is making in the quoted passage is about ontogeny. As we said before, many in the field of evolutionary studies doubt that ontogeny does in fact recapitulate phylogeny (For an overview, see Gould 1977). But if that exact mirroring relation is placed in doubt, then it becomes possible to claim that, when it comes to phylogeny, the one-to-one explanation is quite implausible. This is especially so because the

scarce archaeological evidence we have regarding shared activities in phylogeny—vestiges of ritual, symbolic, and artistic-craft practices—does not point to such one-to-one relations but rather to the collective hypothesis. Thus, in the case of phylogeny the primitive collective view is much more plausible.

What about ontogeny? Tomasello claims that children do not interact collectively before they interact in one-on-one second personal relationships with specific others. But this is not a direct objection to the collective view, for, as said before, minimal collective intentionality does not depend on the existence of already stable groups, rather it describes and encompasses one-on-one interactions. Those are characterized as second-personal relations between particular individuals that interact with one another in intentional activities through which they pursue *collective* goals. The discussion with Tomasello then boils down to the issue of how one interprets second-personal relations. On his view, they are Bratmanian joint cooperative activities. For the collective view, they are kinds of we-intentional relations. We have already pointed to some reasons for preferring the collective view. Yet, the matter now seems to turn on empirical evidence concerning ontogeny. Could the minimal collective view of ontogeny be defended on empirical grounds?

While evidence regarding older children remains controversial, experiments with very young babies—2 to 8 months—provide a clue as to why the model offered here can be thought to be better suited than Tomasello's alternative when it comes to addressing the ontogeny of social interactions.

Reddy (2003) argues that babies as young as 2 months old, before any evidence of shared attention, respond to others in emotion-rich interactions and that these early interactions provide them with a *know-how* understanding of the other person being intentionally directed towards them. Reddy provides evidence of babies at 2 months anticipating intentional actions directed at them (for example, they accommodate their bodies anticipatorily when they are about to be picked up by adults, Reddy 2015) and of compliance with intentional directives at 6 months (including linguistic directives: Reddy 2012, 2015, see also Rochat 2015). This provides evidence for the idea that (inter)action—involving intentional responses and

complementary-structured reactions to others—is developmentally prior to understanding and distinguishing two distinct individual perspectives and sharing distributive goals, as Tomasello’s proposal suggests. These latter abilities seem to depend on social cognitive abilities, including basic forms of ToM, that are thought to develop later. There are also studies involving 8-month-old babies that support the collective view. Ramenzoni & Liszkowski (2016) performed a number of experiments in which 8-month-old babies that do not yet communicate via the pointing gesture use instrumental actions with the apparent expectation that the other will adopt and predict their goals. The authors tested object-reaching actions of 8-month-old babies in two contrasting scenarios: when an adult was present and when no one was present, selectively changing the position of the desired objects with respect to the infants’ action boundaries. They found that the infants in the solo scenario only reached for the object when it was within their action boundaries, while they selectively increased their reaching for far-out objects outside their action boundaries when a parent or a less familiar adult sat alongside. The authors assess their results in the following way:

“This proposal shares much with the ‘shared intentionality’ hypothesis (Tomasello, Carpenter, Call, Behne, & Moll 2005), although we do not wish to make the claim that infants in their first year of life have a differentiated understanding of shared plans and goals. Rather, this latter understanding may be a later developmental achievement that builds on further social interactional experiences (Butterfill, 2012). Earlier in development, *infants may simply assume that other individuals participate in their everyday perceptual and action experiences*, such that [...] they *come to expect a helping hand* when their own falls short of reaching a goal” (Ramenzoni & Liszkowski 2016: 7, our emphasis)

The minimal collective view gives a very congenial explanation of the behavior of the infants in the experiment, according to it infants expect the adult to contribute to their actions because they take the adult to be involved in a collective action with them, not because they have an intellectual grasp of the notion of intention as applied to themselves and the adult. Rather, the baby has practical understanding of the activity she is engaged in as a joint activity in which the adult also has a role to play—namely, in this case, that of providing her with the object she is reaching for (see Satne under review).

The important point here is that the collective intentionality explanatory framework does not presuppose the kinds of cognitively demanding capacities that Tomasello attributes to young children to explain second-personal interactions, and thus it should be preferable as a hypothesis concerning how infants, including young babies from 2 to 8 months, understand others when interacting with them in one-on-one scenarios.

V. Concluding remarks

The aim of this paper was to provide a plausible alternative to Tomasello's way of pursuing the Cooperative Evolutionary Hypothesis. While the proposal was outlined in broad strokes, its main attraction is that it might amount, if substantially developed further, to an account of shared intentionality that dispenses with the condition that shared intentionality requires representing the other's perspectives from the get-go. In this way, it sets the stage to tell a story about the emergence and development of such representational capacities. Introducing a minimal form of collective intentionality to account for early development may then provide one with the right framework and tools to pursue the CEH or so we have argued.

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