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# Social cognition in the we-mode

Mattia Gallotti<sup>1</sup> and Chris D. Frith<sup>2,3,4</sup>

<sup>1</sup> Jean Nicod Institute, Ecole Normale Supérieure, 29 rue d'Ulm, 75005 Paris, France

<sup>2</sup> University College London, 12 Queen Square, London WC1N 3BG, UK

<sup>3</sup> All Souls College, 27 High Street, Oxford OX1 4AL, UK

<sup>4</sup> Interacting Minds Centre, Aarhus University, 4 Jens Chr. Skous Vej, 8000 Aarhus C, Denmark

According to many philosophers and scientists, human sociality is explained by the unique capacity to share the mental states of others. Shared intentionality has been widely debated in the past two decades in ways that also enlighten the current 'interactive turn' in social cognition. In this article, we examine the function and significance for interacting agents of sharing minds in an irreducibly collective mode called the 'we-mode'. This first-person plural perspective captures the viewpoint of individuals engaged in social interactions and thus expands each individual's potential for social understanding and action. This proposal shows that a non-reductionist, interaction-based approach can be developed that nevertheless resists recent suggestions concerning the constitutive role of interaction for social cognition.

## Individualism in social cognition

Traditionally, reflections about the nature and development of mindreading have been central to inquiries into social cognition (see [Glossary](#)). On the classic view, mindreading is the capacity of people to ascribe mental states to others [1,2]. Such mindreading is viewed as the outcome of cognitive processing that occurs in an individual's mind in abstraction from, and as a precondition for, interaction with others [3]. This is mindreading achieved through observation. Recently, this view has met with criticism from disciplines concerned with the problem of social interactions, whether these be low-level spontaneous episodes of coordination or complex instances of planned joint action [4–6]. The argument of the current 'interactive turn' in social cognitive research is that, when interacting, agents appear to have access to more information about the behaviour of their partners than they would as mere observers in a disembodied social context. For example, according to the emerging literature on the role of 'second-person' engagement in social cognition, individuals engaged in real-time social interaction can attain a greater understanding of the goals of others and can use this evidence to ascribe higher-order mental states. This has important consequences for the way social cognition is theorized about and investigated empirically [7,8].

However, despite widespread agreement on the importance of studying real-time interactions, the question remains as to how individuals involved in a joint action

## Glossary

**Cognitivism:** a variant of individualism holding that mental states ought to be individuated so as to supervene on the internal (i.e., brain) operations of the individuals having those states.

**Collective intentionality:** the complex of representational features characterizing the mental events and episodes that are the proximate causes of joint action. Theories of collective intentionality fall by and large in two families depending on whether those features are viewed as attributes of shared states of affairs, such as plans of action, or of the cognition of interacting agents, such as the mode in which they represent aspects of the action scene.

**Co-representation:** the capacity of people to keep track of their own, as well as of actual or potential interacting partners' actions, and to monitor performance in a social setting. Theories of co-representations differ depending on how they characterize the content of co-representations, be it the other person's task contribution to a joint task or aspects of the other person's task (like when it is the other person's turn to react).

**Enactivism:** the approach to social cognition according to which interpersonal understanding and action are constituted by relational dynamics in which autonomous systems co-regulate their coupling as part of the physical and social environment.

**Individualism:** the general view that all sorts of complex behaviours entail properties of the individual as distinct from other levels of functional organization. The entailment relation lends itself to epistemic, semantic, and ontological interpretations. A theory of social cognition is (anti) individualistic if it implies that understanding of other minds is (not) metaphysically determined in abstraction from the individual's social and physical environment.

**Interactionism:** a family of embodied, embedded, enactivist, and extended approaches to cognition, holding the view that explanations of social cognition do not necessarily involve reference to the internal operations of the brain.

**Irreducible collective behaviour:** the claim that joint action cannot be fully explained in terms of the assumptions of individual choice presupposed by causal theories of (joint) action. The we-mode theory of collective intentionality aims to articulate such a claim by assuming that one's potential for social understanding and action is enlarged by cognizing in a dedicated collective mode.

**Joint action:** any form of interaction involving at least two agents that is made fully intelligible by reference to representational features accessed by the subject in the first-person plural.

**Mode:** the property of mental representation that captures the subject's perspective or attitude on the intentional object. Intentional mental states are representations characterized by the object they represent (are 'about') and by the aspectual shape in which the intentional object appears to the subject. The mode of a mental representation is an additional feature of mental content specifying whether action predicated over individuals is represented as something that each person individually intends to pursue or as something to be pursued together with others (joint action). Our use of the term 'mode' is not meant to capture the difference between types of intentional mental states, or 'intentional modes', such as believing, desiring, intending, imagining, and so forth.

**Social cognition:** the processes that sustain people's understanding of, and interaction with, others. Theories of social cognition reflect distinct ways of thinking about the nature of human cognition in terms of processes such as simulation or theorizing (or both) and/or by relational processes between an organism and its environment.

**Team reasoning theory:** among theories of collective intentionality that emphasize the role of cognitive features, this is the view that joint action is underpinned by reasoning in accordance with inferential schemas that represent action as directed to the best outcome for the group (team). The process whereby a situation is conceptualized from the point of view of the group is described as involving 'preference' or 'agency' transformation.

Corresponding author: Frith, C.D. (c.frith@ucl.ac.uk).

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can have their abilities augmented by acting together with others. An influential answer is represented by ‘interactionism’, a family of views motivated by dissatisfaction with the individualistic tendency of psychological research to reduce group psychology to the psychological features of single agents. Generally, interactionists hold that, when agents are poised to interact, they achieve interpersonal awareness through a ‘meeting’ of minds rather than an endlessly recursive exercise of mindreading [9]. When expressed in these terms, the importance of interaction for interpersonal understanding and joint action forges an interesting link between current controversies about the nature of social cognition and philosophical discussions of joint action. By and large, philosophers agree that agents must have their mental states *qua* intentions ‘shared’ for an action to be joint [10], yet they disagree about the conditions that bring about the relevant sharing of minds. For some theorists of shared intentionality, agents must see their actions as directed to something that they are going to pursue together (as a ‘we’) if action is to count as joint [11,12]. This sense of ‘we-ness’ is a striking feature of the psychology of collective behaviour, hence the view that interacting agents have their minds shared by cognizing in an irreducibly collective mode of cognition called the we-mode.

In this article, we propose a theory of the we-mode that captures the role of interaction for expanding the social-cognitive resources of individuals. Our proposal is that individuals engaged in joint action have a broader understanding of the behaviour of their partners, and thus of options available for action, by representing aspects of the interactive scene in the we-mode (Box 1). With this proposal, we aim to offer a balanced response to the demand for an interaction-based approach to social cognition: we share the concern of interactionists regarding the excessively reductionist nature of classic mindreading theories, but we also draw on fundamental assumptions about the role of the individual in addressing the questions of sociality more generally. In order to develop philosophical insights concerning the we-mode into a scientifically plausible model, we bring together various strands of research on joint action in the cognitive sciences and the neurosciences.

### Interactionist social cognition

An influential attempt to capture the role of interaction for social cognition is represented by ‘interactionism’ [9], a family of views unified by opposition to various forms of individualism, such as cognitivism. According to interactionists, the theory-of-mind research tradition has confronted the problem of social cognition in an individualistic fashion, being concerned only with the question of what the individual brings to interaction. Social understanding and action have thus been characteristically depicted as the output of cognitive processing taking place in individuals [13]. In contrast to this view, most interactionists embrace the enactivist position that the life and cognition of agents are regulated by their dynamic encounters with the physical and social environment [14]. These encounters are not reducible to attributes of the individual mind, because it is the interactive unit that

### Box 1. Groups with minds vs minds in the we-mode

Since its appearance, collective intentionality has been given a prominent role in accounts of the foundations of human sociality because it addresses the question of how individual agents come to intend and pursue things together [51]. Yet, not every episode of interaction between at least two persons can be classified as such. Actions involving more than one agent acting on their own are merely accidentally, not intentionally, collective.

One example will help to illustrate the difference. The sentence ‘Renzo Piano and Richard Rogers designed the Pompidou Centre’ expresses the idea that each architect made his own contribution to the final creation. However, it also allows a collective reading of the sentence: what they did – they did it jointly. On this reading, the project was a truly collective outcome resulting from the two architects acting as a group, as opposed to the meaning of ‘Piano, like Rogers, designed parts of the Pompidou Centre’, which suggests that action predicates are distributed over the individuals. This is to say that, when two or more agents come together and act as a group in achieving a collective goal intentionally, the statement that they do something together can be read as suggesting that no member of the group does it ‘on her own’ [52].

*Prima facie* two responses are conceivable to the question of how to conceptualize, and account for, the specific attitude that underpins collective intentional behaviour. The first response characterizes the irreducibility of group behaviour as a feature of the bearer holding the relevant attitude, namely the group (rather than the individuals forming the group). The possibility to ascribe a ‘we-as-a-group’ attitude implies that there is a plural subject, that is, a minded group, to which the attitude can be ascribed.

The second response focuses on features of the individuals forming the relevant group [53]. In contrast to the former response, in the early days of collective intentionality theory, philosophers started to investigate individual-level features in terms of the type of attitude that persons display when they intend and do something with others, focusing on the way in which each represents the intentional structure of a joint endeavour. The intuition that behaviour can be guided by mental states that are collective in that they are accessed in a first-person plural mode led to the emergence of we-mode accounts of collective intentionality [11,12].

behaves in a certain way, and the cause of this behaviour is captured by the collective dynamics themselves. Interaction thus offers not only a context for social cognition but, most emphatically, it can constitute individuals’ social cognitive resources in a way that need not be mediated by changes intrinsic to the individual [5].

Although it is crucial to stress the enabling role of the environment for interpersonal understanding, in general, we believe that claims about its allegedly constitutive role miss the point of the interactive turn in social cognitive research. To see why, note that enactivism implies two claims about (social) cognition. One is that cognitive activity consists predominantly in making sense of things in the world, where sense-making is the relational process between an organism and its environment that transforms the world into a place of meaning and value [15]. When the environment is social, sense-making occurs in a participatory manner [14]. The other claim concerns the scope of ‘participatory sense-making’. To say that meanings emerge and are continuously negotiated by virtue of individuals’ interactive coupling with the social world amounts to saying nothing more than that interaction dynamics define and constrain the content of individual minds [16,17]. Although the former claim, namely, that features of the physical and social environment shape cognition, has been widely scrutinized, for example, in the extended-mind [18]

and mechanistic literature [19], somewhat less attention has been devoted to assessing the scope of participatory sense-making, that is, the extent to which enactivism succeeds in capturing the role of interaction, not just for cognitive processes in general, but for social cognition more narrowly.

The idea of participatory sense-making is that central aspects of (individual) cognitive performance, notably meaning-formation, are inherently relational. It is by interacting with physical and social objects, including the minds of other people, that the world becomes meaningful to individuals. How does such a view answer the question of the role of interaction for social cognition? That is, in what sense do interacting agents get to know more about the behaviour of others in the context of interaction than they do from a detached point of view? One answer is that cognition is necessarily modulated by interaction with others, because meanings are acquired and shared through interactive practices – a point that most enactivists and cognitivists alike would be happy to accept. However, there is a crucial difference between making sense of the world with others and making sense of others as part of the world people live in [20]. The interactive turn in social cognition implies that, when people engage with others, there might be something unique to the way in which they make sense of others' minds that is not reducible to the kind of cognitive processing at work when understanding other worldly offerings. We believe that enactivists miss this difference insofar as participatory sense-making is presented as yet another formulation of the claim that meanings are created through the interaction among people in general. Indeed, this claim stands as a fruitful reminder for cognitivists that the intentionality of the mind – how things in the world are represented as having certain meanings – cannot be causally reduced to a series of processes going on in the head of individuals. Nonetheless, it should be clear that the social, that is, embedded, character of cognition is not under question in this paper. In the present context, we need a theory of the role of interaction for social cognition, namely, a theory that explains how novel routes to knowledge of other minds become available to individuals who are poised to interact, rather than a refined version of the argument for the social foundations of (individual) cognition.

### Shared intentionality and the interactive turn

We agree with interactionists that the tendency of psychological research to focus on the isolated observer is unsatisfactory [21]. This tendency implies that the relationship between mind and society can be explained simply by generalising claims about cognition within the individual to social cognition. In fact, agents engaged in a social activity achieve a result that is not reducible, at the appropriate level of description, to the sum of their single contributions. Indeed, when they act together in groups, individuals have access to information about the intentions, reasons, and emotions of their interacting partners that opens up novel possibilities for action unavailable to isolated observers.

For this very reason, our concern is not with the irreducibility of group to individual behaviour which, despite

disagreements, seems to unify advocates of the current interactive turn. We are rather concerned with the cognitive processes underlying group behaviour. This motivation becomes especially vivid in episodes of sociality where agents interact in a manner which seems rational for the group, but which cannot be reconstructed as rational for the individual given traditional assumptions of how individuals reason in social interactions. On these assumptions, there are features of group behaviour that cannot be fully explained by reference to mechanisms of individual cognition and agency [22]. Furthermore, sometimes individuals appear to be thinking and acting in ways that are even detrimental to the pursuit of their own benefit [23–26]. How, then, can a non-reductionist, interaction-based, approach to social understanding and action be accommodated in a theory that purports to avoid the most radical claims of interactionism?

We suggest that the problem with individualistic accounts of social cognition stems from the underlying model of how people cognize in the context of interaction. The spectatorial view of social cognition accounts for the behaviour of interacting agents from the perspective of an observer *qua* theorist, who represents the decision problem faced by the agents as it appears to him. Yet, engaging in interaction changes the way in which interacting agents understand the problem, in that contextual features of the interactive scene prime representations that are not available to the isolated 'theorist' [27,28]. According to philosophers, if action is to count as truly joint action, it is not sufficient that individuals pursuing a collective goal each individually intend to contribute [10]. Sociality is not just physical co-presence: it involves some actual or potential understanding of aspects of the interactive scene as shared by the participants in a joint action [29,30]. To illustrate the idea, imagine that Mary and John come across a friend in difficulty and offer help. It seems plausible that whatever they mean to do in order to bring about joint assistance, they do it together. In other words, it is because Mary and John see each other as being part of the same 'group' that Mary understands John doing his part, and herself doing hers, as contributions to something that they are doing together, rather than just as the result of individual tasks undertaken simultaneously. More generally, when people join forces and act as a group, there is a sense in which the fact that they do something together implies that no member of the group does it 'on her own'. This sense of 'we-ness' is a striking feature of the psychology of collective intentional behaviour, hence the view that joint action involves shared or collective or 'we-intentions' [31].

Few would doubt that the propensity to share mental states is a basic feature of humanity – perhaps the distinguishing developmental trait of human cognition in the animal kingdom [32]. However, there is much disagreement about the conditions under which people's mental states are said to be shared and which method is most appropriate to examine the irreducibility of shared minds to attributes of the individual mind [33,34]. In the present discussion, we will focus on one philosophical view of shared intentionality, which characterizes the processes that form and sustain shared minds in terms of an irreducibly collective psychological attitude or 'mode' [11,12].

We shall refer to these processes as we-mode processes (first-person plural) and present them as parts and operations of the mechanism responsible for the ‘meeting’ of minds that is essential to joint action. One major reason for taking this route is dissatisfaction with the assumption that interactions are always guided by representations in the head of agents representing states of affairs, including others’ minds, from the perspective of the thinking and experiencing subject ‘I’. However, before we show how this approach offers a solution to the question of how individuals have their potential for social understanding and action expanded in the context of interaction, we need to specify what a we-mode process is and how it works.

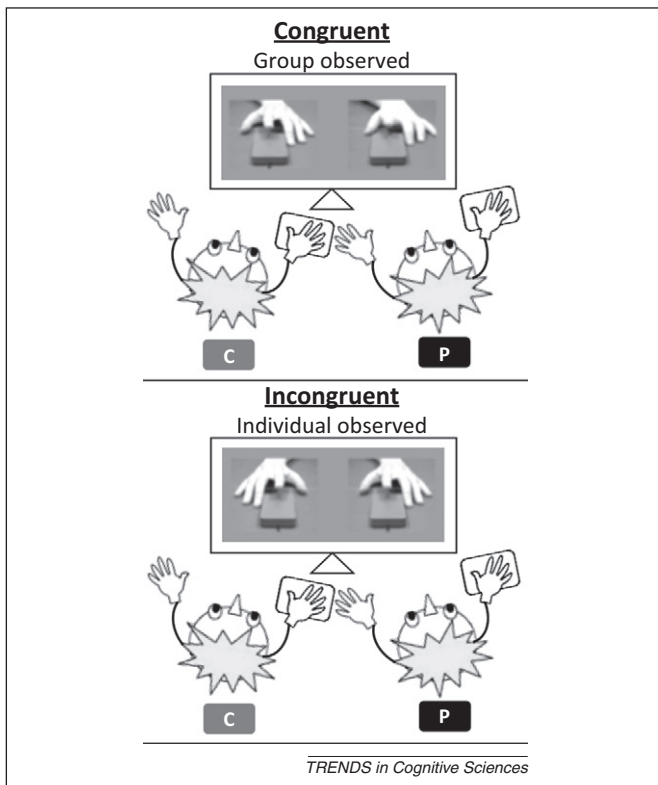
### Cognizing in the we-mode

The central idea of the we-mode is that interacting agents share their minds by representing their contributions to the joint action as contributions to something that they are going to pursue together, as a ‘we’. On such a view, cognizing in the we-mode does not entail that individuals have mental representations of their task with the same, or similar, content, or a specific representation of ‘togetherness’, or ‘we-ness’. To represent things in the we-mode is for

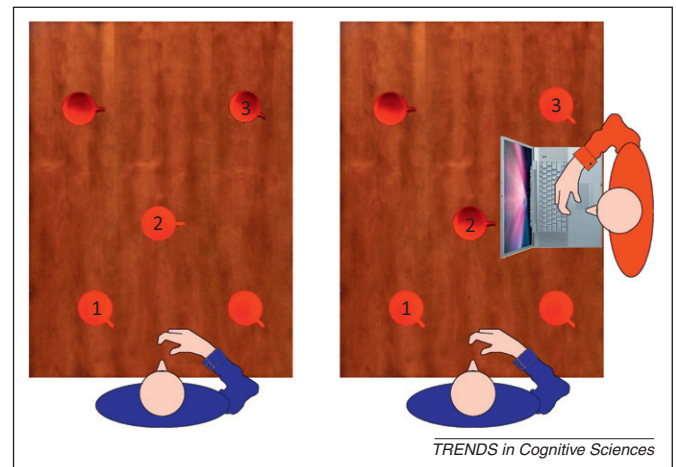
interacting individuals to have the content of their individual actions specified by representing aspects of the interactive scene in a distinct psychological attitude of intending-together, believing-together, desiring-together, etc. [31]. This is the same as saying in the previous example that Mary and John understand what they do in terms of Mary doing her part and John doing his, only as part of their doing it together.

To articulate this insight, consider the capacity of individuals to team-reason. Many episodes of sociality admit of a rational explanation on the premise that agents make decisions *qua* members of the group of which they are poised to be a part (the ‘we’) [22,25,35–37]. For team reasoning theorists, the claim that you see, or ‘frame’, your action as part of an endeavour that we-as-a-team are pursuing together means that you are in the position to work out which course of action by all members of the group is best suited to pursue the joint task [38]. You then act accordingly by doing your own part [39]. This suggests that by representing in the we-mode, my action as a member of the group will be guided by an individual-level representation of what we are doing jointly (a ‘we-representation’). Indeed, according to the ‘GROOP effect’ [40], individual performance varies in a joint task depending on whether the participants represent their task as a contribution to something that the group carries out or as something to be performed by the individual alone (‘me-representation’) (Figure 1).

However, in order for a person to figure out her part as a contribution to something that is jointly achieved by all members of the group, agents must be able to co-represent the actions of their actual or potential interacting partners by taking into account their perspective on the interactive



**Figure 1.** We-representations and me-representations. Background: according to prior research [54], individuals tend to co-represent the action of the other when they perform tasks next to each other. The GROOP-effect experiment explores the possibility that the action-perception relation in individuals is also influenced by whether they feel themselves to be part of a group. Interpretation: in the congruent condition, the participant and confederate see two left hands, which imply two people working together, like them. In the incongruent condition, they see a left and a right hand, which imply one person working alone. Evidence that the participant represents the task as a contribution to something that the group carries out, or as something to be performed by the individual alone, comes from the effects of congruent and incongruent displays on the reaction time of the participant. Reaction times are speeded in the congruent group condition compared to the incongruent individual condition, even though, at the individual level, the task of responding to the movements of the right hand on the screen is identical. Reproduced, with permission, from [40].



**Figure 2.** Co-representation and perspective-taking. Background: the figure shows a situation designed to illustrate the role of perspective taking in developing the co-representations necessary for cognizing in the we-mode. Interpretation: Mr. Blue is sitting at a table with four mugs on it. For him, each mug on the table has an affordance or action salience associated with it that indicates whether it is potentially available for action [41]. Although the sharing of minds in the we-mode requires more than just co-representing others’ viewpoints, co-representations are automatically generated when there is a potential for joint action (Box 2). From the point of view of Mr. Blue, mugs 1 and 2 have high affordance, because they are in his reach, whereas mug 3 has low affordance, because it is out of reach. The presence of a potential collaborator, Mr. Red, elicits co-representations by inducing Mr. Blue to take into account the perspective of Mr. Red. The map is changed to represent actions available to the ‘group’, so mug 3 now has a high affordance, because it is in reach of Mr. Red [50]. By contrast, mug 2 now has a lower affordance, since Mr. Red cannot see it [36].

### Box 2. The ‘illusion’ of interaction

According to philosophical theories of joint action, individuals have their minds shared when they interact intentionally [10]. On the premise that the sharing of minds is formed and sustained by we-mode processes, such as processes of co-representation, we argue that cognizing in the we-mode captures the role of interaction for social cognition, that is, the fact that agents have their potential for social understanding and action expanded in the context of interaction.

However, there is evidence that individuals tend to co-represent the viewpoint of others in the interactive scene, even in situations where they are just potential, rather than actual, interaction partners [43]. Does this mean that cognizing in the we-mode is also possible when agents are mere observers of others’ interactions? If so, what would be the point of claiming that cognizing in the we-mode explains how individuals have their social-cognitive resources enhanced in the context of interaction, if one can be just a potential interactant, namely, a spectator, and yet cognize in the we-mode? To answer these questions, notice that being in a joint action is sufficient for two agents to co-represent their perspective on the action scene, but the converse does not hold. Hence, if an action is to count as joint, there is more to the processes that underlie shared mental states than just co-representation.

At least two agents must engage in the type of reasoning-as-a-we (team) that underlies thinking and enacting things in the we-mode. In more detail, individuals cognize in the we-mode when they see their actions as contributing to something that they are doing together and then act accordingly by contributing their own part. To this end, the capacity to co-represent the others’ perspective is essential for framing the scene of action. However, in addition to this, mental states are shared in the case of joint action when at least two agents engage in team-reasoning and explicitly reason that a certain goal is best for the group and act appropriately on the relevant intention [55].

scene (Figure 2). Co-representations serve various functions in joint action, such as providing control structures and governing action monitoring during episodes of online coordination [41,42]. Moreover, there is evidence that individuals keep track of what the others do even in the mere presence of other people (Box 2), when interaction is not going to happen, and/or when co-representing others’ perspective turns out to slow down an individual’s performance. This justifies the claims that priming a given situation in the we-frame is not a matter of rational choice and the we-mode might work as an implicit and automatic mechanism of mentalizing [43].

### Interaction in the we-mode

The thrust of the interaction-based approach to social cognition is that, when they are in the position to interact, individuals have their interpersonal understanding enhanced through a ‘meeting’ of minds rather than an endless ascription of high-order mental states [7]. How, then, would a theory of shared agency in the we-mode explain the fact that interacting individuals get to know more about each other’s propensities and disposition to act than mere observers?

On our proposal, when action is performed by a group of individuals thinking in the we-mode, the social environment adjusts agents’ potential for social cognition by providing a broader understanding of the options available for action, thus providing novel solutions for action. Co-representing the others’ viewpoint on the action scene as a condition for acting jointly modulates the space of mental

### Box 3. Questions for future research

- What are the differences, if any, between an account of the processes that form and sustain shared intentions in terms of we-mode processes and one that gives explanatory prominence to the second-person perspective? What would the implications of these differences be for psychiatric and pathological disorders of social cognition?
- How can theoretical and experimental strands of research, such as the team-reasoning and the co-representation literature, be further integrated with the aim of generating empirically testable hypotheses of the we-mode?
- Can a scientifically informed theory of the we-mode provide conceptual and empirical insights into the nature and functioning of social cognition as a whole?
- What are the methodological consequences of endorsing a theory of the we-mode in social cognition for the design and implementation of experiments investigating the neural mechanisms of social interaction?

activity and, therefore, behaviour, by providing each agent with access to a set of descriptions and concepts that would be unavailable from the observational, first-person singular or third-person, perspective [44]. For example, actions that would not be available to me on my own are added because they are available to someone else in my group [45–50]. Interestingly, this theory suggests that the mind is not just a product of the social: it is social all the way through. Human cognition is enriched with resources for cognizing in an irreducibly collective mode that remain latent until individuals become engaged in particular interactive contexts. In this respect, the we-mode is a property of individuals but, since it manifests during active participation in group behaviour, it cannot be understood in purely individualistic terms.

We conclude by clarifying this claim in one important way. This theory of social cognition is consistent with individualism, because the we-mode is a mechanism organized around cognitive and neural structures that are intrinsic to the individual and result from a dedicated evolutionary and developmental history [32]. However, we do not assume that there is a ‘contrast’ between the individual and the social, which can only be addressed by choosing one side or the other. Rather, in line with most recent discussions in social cognitive neuroscience [8], we have sought to integrate those levels into a mechanism-oriented approach to social cognition, while remaining committed to a non-reductionist view of collective psychology. Our suggestion is that social cognition is embedded in the social environment to an extent that should be more carefully pondered and theorized by individualistic-minded scientists and philosophers alike (Box 3).

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