

Research Article

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Mirror Neurons, Husserl, and Enactivism: An Analysis of Phenomenological Compatibility

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Abstract: The potential for mirror neuron research to explain various aspects of social cognition has received considerable attention over the past two decades. Initially, mirror neuron research may seem in accordance with a phenomenological understanding of intersubjectivity, but the work of Dan Zahavi will be used to highlight significant incompatibilities between the two. Likewise, the enactivists Thomas Fuchs and Hanne De Jaegher identify significant issues with current interpretations of mirror neuron research and provide an alternative description of intersubjectivity. This article will assess whether the enactivists are able to provide a more phenomenologically consistent alternative to mirror neuron research alone, eventually determining that their enactive account overcomes Zahavi's incompatibilities. Consequently, Fuchs and De Jaegher should acknowledge their relation to Husserlian descriptions of empathy in their account, and mirror neuron research should be contextualised within a broader, phenomenologically-compatible framework, as that of the enactivists.

Keywords: mirror neurons; Husserl; empathy; social cognition; intersubjectivity; enactivism

Preface

Since the initial studies of F5 neurons in macaque monkeys in the late 1980s¹ and the identification of these neurons as 'mirror neurons' in the mid-1990s², the topics of social cognition and intersubjectivity have been dominated by discussion of mirror neurons. This focus stems from the possibility that mirror neuron research can provide the best explanation for the way we interact with each other. Emotional empathy, action understanding, and mind-reading are only a few of the topics that have been attributed to neurological activation in areas with these supposed mirror neurons, and many scholars have reacted strongly:

The discovery of mirror neurons in the frontal lobes of monkeys, and their potential relevance to human brain evolution... is the single most important unreported (or at least, unpublicized) story of the decade. I predict that mirror neurons will do for psychology what DNA did for biology: they will provide a unifying framework and help explain a host of mental abilities that have hitherto remained mysterious and inaccessible to experiments (Ramachandran, 2000, para. 1).

Indeed, much significance has been attributed to mirror neuron research due to the supposed ability for this research to justify accounts of intersubjectivity as described by psychology as well as other fields, thus transcending the disciplinary divisions. Within philosophic practice in particular, intersubjectivity has been a recurring topic that has long been contemplated by various prominent academics. One such

1 See Rizzolatti et al. (1988).

2 See Gallese et al. (1996).

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academic is the 19th century German philosopher Edmund Husserl who expanded on the role of empathy (*Einfühlung*) in the constitution of ourselves and our ‘lifeworld’ (*Lebenswelt*). Known as the founding father of phenomenology, Husserl’s phenomenological work on empathy had a strong influence on later philosophers, such as Edith Stein and Maurice Merleau-Ponty. If a phenomenological account is meant to capture the essence of experience, as was established by Husserl as the purpose of his transcendental method,³ then the claim that mirror neuron theories support a phenomenological description is indeed noteworthy. This article will thus highlight a few testimonies in which Husserl’s accounts of intersubjectivity and empathy seem in agreement with the intersubjectivity described by many mirror neuron studies. However, shortly thereafter, we will turn to the work of Dan Zahavi to discover significant problems with this association. In response, we will shift to the enactivists Thomas Fuchs and Hanne De Jaegher for their own criticisms of mirror-neuron-based theories and explain why they believe their enactive approach to be superior to mirror neuron research alone in describing intersubjectivity. Finally, we will see if their alternative is indeed an improvement insofar as it is able to overcome the concerns highlighted by Zahavi, and thus, prove itself more consistent with Husserl’s descriptions of intersubjectivity.⁴ If this is determined to be the case, the implications of this article are twofold: 1) The enactivists can and should acknowledge Husserl’s descriptions in their accounts, and 2) If one wants to provide explanations of intersubjectivity true to phenomenological descriptions, mirror neuron research must be contextualised within a more accommodating framework, such as that of Fuchs and De Jaegher’s enactivist account.

I. A Brief Introduction to Mirror Neurons

According to Gallese, Keysers, and Rizzolatti (2004), the neurological system that comprises mirror neuron activity serves as “the fundamental mechanism at the basis of the experiential understanding of others’ actions” (p. 396). Their reasoning is as follows: Because two individuals have similar brain-body systems, there can be a process of ‘mirroring’ or ‘simulation’ between areas of one individual’s neuronal system and areas of another individual’s neuronal system – these respective brain areas are referred to as ‘mirror neurons’. The authors find support for their claim in experimental evidence, concluding that mirror neurons permit the “direct experiential grasp of the mind of others” (Gallese et al., 2004, p. 396).

The topic of mirror neurons has captured the attention of researchers because these groups of cells exhibit activation not only during the performance of a movement, but also during the observation of another performing that same movement. According to a prominent early study by Gallese et al. (1996), approximately 17 per cent of cells in the F5 area of macaque monkeys qualify as mirror neurons,⁵ and about one-third are selective for one type of action. Specifically, mirror neurons have been shown to respond when either performing *or observing* goal-directed actions (e.g., picking up an object and placing it somewhere) (Rizzolatti et al., 1996).⁶ As such, mirror neuron research has been linked to action understanding, such that understanding another’s action need not require higher-level interpretation by a central conceptual system but persists as a direct result of the observation itself, or what Gallese et al. (2004) describe as “the ‘penetration’ of visual information into the experiential (‘first person’) motor knowledge of the observer” (p. 396).

Indeed, turning to the wealth of empirical data, one finds further evidence suggesting that the observation of another’s goal-directed action can result in the activation of the same motor circuits in both the performer and the observer. Umiltà et al. (2001), for example, conducted a study in which action-

³ For example, see Husserl, 1997, p. 118-119.

⁴ Husserl’s writings on empathy spanned his career, and as such, his portrayal of intersubjectivity should not be understood as complete nor coherent. Indeed, many scholars identify drastic shifts in perspective from early works such as *Logische Untersuchungen* and *Ideen I*, which work to lay the foundation for his transcendental phenomenology, to *Die Krisis* in which he expands upon the constitution of a ‘lifeworld’. However, this article will overlook these transitions and extract limited yet central ideas relevant to the collection of Husserl’s writings on interpersonal experience.

⁵ Subsequent research has expanded the scope of mirror neurons to include other areas such as the parietal cortex (Gallese et al., 2002) as well as the primary motor (M1) and dorsal premotor (PMd) regions (Tkach et al., 2007).

⁶ Activity in these cells is not exhibited in cases of pantomime (lacking an object to grasp) nor in the observation of objects alone (lacking hand movement) (Rizzolatti et al., 1996).

specific mirror neuron activation was triggered even when the final part of the act (i.e., ‘goal’) was occluded. The experimental design involved four conditions:

- A) The experimenter’s hand moves towards and grasps an object in full view
- B) The experimenter’s hand moves towards and grasps an object behind a screen
- C) The experimenter’s hand moves towards and grasps an imaginary object (miming)
- D) The experimenter’s hand moves towards and grasps an imaginary object behind a screen (hidden miming)

Results revealed that the majority of scrutinised neurons showed activation in both A) and B) but not in C) or D). Therefore, Umiltà et al. (2001) concluded that because mirror neuron activation need not depend on the *direct* observation of an action and its goal, the activation seen in these areas also indicates a level of action *understanding* necessary to infer the presence of an object behind a screen and discriminate against cases in which the occluded object is not present. In another example, Fogassi et al. (2005) found that activation in the inferior parietal lobe (IPL) was significantly distinct depending on the type of action observed (grasping-for-eating versus grasping-for-placing). Moreover, activations were selective *during the grasping action* (before completion of the task), indicating that the relevant IPL cells were sensitive not only to the specific action, but also to the specific *intention* of the act. In other words, these two studies seem to indicate that the ability of an observer to understand another’s action and the intent of that action (i.e., to empathise) is attributable to similar mirror neuron activity for both observer and performer – the assumption being that similar neuronal activity entails similar experiences.

Of course, the relevance of these studies and their respective conclusions are debated within academic literature.⁷ Because most of the empirical evidence arrives through experimentation with monkeys, there exists much debate over the presence of mirror neurons in humans. Indeed, most of the scientific evidence for humans employs indirect methodologies such as fMRI studies. Nevertheless, the majority of research indicates similar cortical activation of ‘mirror neurons’ in humans as well as in monkeys.⁸ While this article will not attempt to resolve this dispute, it is important to note that mirror neuron activity is a discovery that has redirected the ways which the scientific community discusses and understands interpersonal interaction, observation, and empathy. Thus, the rest of this article will take for granted the debated scientific validity of mirror neuron theories and their controversial applicability to humans, instead focusing on the philosophical implications of mirror neuron research on intersubjectivity.

II. Husserl and Mirror Neurons

At first glance, the aforementioned mirror neuron research seems quite in alignment with Husserlian empathy:

In fact, Husserl even writes, and this does sound remarkably like formulations found in Gallese, when I perceive the movement of the foreign body, it is *as if* I were over there, as if I were moving my limbs (Hua 15/642, 4/164). When I see the foreign hand, I feel my own hand. If I see the other hand move, I am inclined to move my own hand. My own kinesthetic system is affected by my perception of his moving body and by my anticipation of his future movements (Hua 14/527, 15/642) (Zahavi, 2011, p. 239-240).

Zahavi is far from the only philosopher to recognise this similarity. Others include Matthew Ratcliffe (2009) who contends that important parallels can be drawn between the intersubjectivity described by Husserl as a pre-reflective and non-inferential ‘*analogising apperception*’, and mirror neuron research, which claims a direct link between observing another’s actions and one’s own experience without the need for higher-level processing. He cites the work of Gallagher (2001) in claiming that “neuroscientific findings can provide support for Husserl and can also be integrated into the interpretation of phenomenological descriptions by clarifying the kind of relation described and showing how it need not be something

⁷ See Hickok (2009) and Dinstein, Thomas, Behrmann & Heeger (2008).

⁸ See Kilner & Lemon (2013).

mysterious or even impossible” (Ratcliffe, 2009, p. 339). Additionally, he goes on to say how this support is reciprocated, whereby Husserlian phenomenology can justify the neuroscientific research by providing “a phenomenological framework in which the role of mirror neurons can be conceptualized, interpreted, and explained” (Ratcliffe, 2009, p. 336). Even Evan Thompson, who has conducted much work under the banner of enactivism, draws a similar connection. With regard to mirror neuron research, he states: “...this kind of non-inferential bodily pairing of self and other is one of the hallmarks of the phenomenological analysis of empathy. Indeed, the mirror neuron findings support Husserl’s position that our empathetic experience of another depends on one’s ‘coupling’ or ‘pairing’ with the other...rather than some kind of affective fusion, as some of Husserl’s contemporaries held” (Thompson, 2001, p. 9).

However, we will now turn to a more comprehensive view of Zahavi’s work to see if the relation between mirror neurons and Husserl is really as compatible as it seems. In his 2011 paper, ‘Empathy and mirroring: Husserl and Gallese’, Zahavi analyses whether mirror neuron accounts of empathetic action understanding are actually in accordance with Husserlian phenomenology, and he concludes that “unfortunately, the question is too complex to really allow for a simple yes or no answer” (p. 245). We have already seen that Zahavi recognises similarities between mirror neuron theories of intersubjectivity and empathy as described by Husserl. However, his ambivalence towards this relationship arrives through the acknowledgment of equally important distinctions between the two.

First, according to Zahavi, the explanatory scope of mirror neuron activity must be evaluated: To what extent can mirror neuron research explain intersubjectivity?⁹ This is particularly important for any comparison with a Husserlian description of empathy because, for Husserl, interpersonal understanding persisted at a variety of levels:

In a manuscript from 1931-32, he operates with even more levels. The first level of empathy is the appresentation of the foreign lived body as sensing and perceiving. The second level is the appresentation of the other as physically acting, say, moving, pushing, or carrying something. The third level goes beyond this and sees, say, the running of the other in the forest as flight, the hiding behind a stone as protection from missiles, etc. (Hua 15/435). On a few occasions, Husserl goes even further and also speaks of the kinds of empathy involved in apprehending the unity of a normal community and in appropriating foreign traditions (Hua 15/436, HuaM 8/372-373) (Zahavi, 2011, p. 242).

Even if mirror neuron research indicates the passive and involuntary pairing of self with other, this should not be misinterpreted as portraying the full extent of interpersonal understanding. Indeed, the level of action understanding claimed in the aforementioned mirror neuron studies would be insufficient in capturing the entire scope of possible meanings for any given action. After all, goal-oriented actions are embedded within a framework of meaning that extends far beyond the physical movement itself. Zahavi (2011) makes the point that the givenness of the other is not simply about the actions and experiences of the other, but rather, “the other is given as intentional, as directed at the same world as I, and the other’s world, and the objects that are there for him, is given along with the other (Hua 14/140, 14/287, 13/411, 4/168, 1/154)” (p. 243). As a consequence of this robust understanding of intersubjectivity, the self-other relation works to constitute not only the other and her experiences, but also the lived world more generally, and it is for this reason that “the plausibility of the mirror neuron hypothesis increases in reverse proportion to its alleged explanatory scope” (Zahavi, 2011, p. 247). In other words, the more heavily we rely on descriptions of mirror neurons to explain various aspects of social cognition, the less likely it is that mirror neuron research can sufficiently support the complexity required to bear relevance to Husserl’s multi-layered descriptions of empathy and the role intersubjectivity plays in our understanding of the world.

Zahavi’s (2011) second criticism of mirror neuron accounts is their frequent affiliation with simulation theory (p. 247), which can be described as the “attribution of mental states via emulation or replication of states of the other” (Jensen & Moran, 2012, p. 2). According to Zahavi (2011) this understanding of intersubjectivity implies a form of projectivism whereby we assume one cannot access the experience of another, so we must rely on our own internal simulations to transform our perceptual input into what

⁹ In fact, the explanatory scope of mirror neuron research comprises a large part of the debate regarding the validity of many mirror-neuron-based accounts of social cognition.

we ascribe as the ‘mental states’ of others (p. 247). Though most mirror neuron accounts contrast with an understanding of simulation theory in which an agent *deliberately* or *rationally* places herself in another’s shoes, mirror neurons are often described within scientific literature as facilitating a direct and automatic simulation of another’s actions and intentions. This is clearly seen in sections of Gallese (2009) in which he claims that mirror neurons provide “a parsimonious solution to the problem of translating the results of the visual analysis of an observed movement – in principle, devoid of meaning for the observer – into something that the observer is able to understand” (p. 520 - 521). Essentially, even if we inadvertently convert visual observations into internal simulations that are projected or attributed onto the other, Zahavi maintains that such an understanding would be inconsistent with Husserlian phenomenology.

Thirdly, even if one is to describe the implications of mirror neuron activation such that simulation and projectionism are not involved, Zahavi claims that the concept of mirroring itself is not in line with Husserlian thought, and he gives several reasons. One is that to explain the self-other relationship as ‘mirroring’ would be too static of a concept. It would not permit the “dynamic and dialectical intertwinement between self and other,” which contrastingly, Husserl’s texts promote (Zahavi, 2011, p. 248). But another reason Zahavi provides is that theories involving mirror neurons often fail to respect the other as an other, while for Husserl, his phenomenology emphasises the alterity of the other. Indeed, even Gallese (2009) concedes this idea when he states that “the ‘objectual other’ becomes ‘another self,’ a like-me, who nevertheless preserves his or her alterity character” (p. 527) as well as when he later admits that the mirror metaphor is potentially misleading as it implies a direct match between the observer and the ‘other’ being observed (p. 531). Nonetheless, it remains to be seen how sufficient appreciation for ‘the other’ can stand in accordance with the majority of mirror-neuron-based descriptions of intersubjectivity and social cognition found within academic literature, including that of Gallese.

Lastly, Zahavi (2011) highlights the difference between personal and subpersonal accounts of empathy, with Husserlian phenomenology adhering to the former and mirror neuron theories to the latter (p.248-249). In other words, Zahavi points out that the two actually describe different things – Husserl describes empathy at the level of the person or agent, whereas mirror neuron research accounts for empathy at the level of neurological activity. Any link from the one to the other is thus difficult to draw without relying on claims such as isomorphism or symbolic representation¹⁰, which would be controversial and require much additional justification.

III. An Enactive Criticism of Mirror-Neuron-Based Theories

In their paper, ‘Enactive intersubjectivity: Participatory sense-making and mutual incorporation,’ Thomas Fuchs and Hanne De Jaegher (2009) describe this mirror neuron research as favouring “a third-person paradigm of social cognition as a passive observation of others’ behaviour, based upon an inner modelling process in the individual brain” (p. 466). The authors see it as problematic that there exists no interaction between the two individuals beyond passive observation and direct yet internal simulation from the observer, and moreover, that a framework is presupposed in which interaction is first described at the level of (neuronal) simulation, which is then used to explain or even predict the interaction itself. In contrast, Fuchs and De Jaegher (2009) propose that, “social understanding is not realised by ‘snapshot’ activities of one individual’s theorizing or simulating but *arises in the moment-to-moment interaction of two subjects*” (p. 466). This moment-to-moment interaction is a dynamical and embodied process consistent with an enactivist approach¹¹ and may include interactions such as the coordination of gestures or vocal expressions, bodily resonance, and affect attunement. Furthermore, the authors claim that their understanding of social cognition relies heavily on Merleau-Ponty’s concept of ‘mutual incorporation’. More will be said on this in the coming sections, but it is important to currently acknowledge that Fuchs

¹⁰ See Marr (1982), for example.

¹¹ Of course, this is but one of many descriptions of social cognition that fall under the varied label of enactivism. Other accounts should certainly be considered but are beyond the scope of this particular article. See Di Paolo, Rohde, & De Jaegher (2010) for a discussion of the varieties of enactivist accounts of social cognition.

and De Jaegher (2009) ultimately describe their approach as appreciating both the dynamic coupling of two agents and a phenomenological perspective:

Combining a dynamical agentive systems perspective with a phenomenological perspective will allow us to link two sides of the same process – the interaction. The dynamical agentive systems approach observes and describes the interaction as a coordination process between intentional and embodied agents...The *phenomenological approach* takes an immersive perspective, starting from a first- and second-person take on the same process and describing the experience of the mutual engagement in phenomenological terms (p. 466-467).

Again, one may argue that mirror neuron research describes (or is at least consistent with) a phenomenological perspective. However, Fuchs and De Jaegher's main issue with mirror neuron accounts is that they provide subpersonal understandings of intersubjectivity, and as such, there is no subject to interpret the simulation or mirroring. The matching cortical activations described in the scientific literature are the direct result of action observation, and thus, do not require higher-level processing (indeed, that seems to be their primary appeal). Yet this renders such cortical activation no more than a description of neurological activity that is impartial at the subject level. After all, the core of the claim is that the same mirror neuron activation is observed whether performing an act or watching another perform that act, and as such, mirror neurons could not then discriminate between one agent or another. In fact, Fuchs and De Jaegher hold that mirror neurons do not actually 'simulate' at all since, in contrast, that would require the intentionality of a subject. It is in this sense that the authors believe mirror neuron research, while perhaps relevant, cannot do the heavy lifting when it comes to explaining intersubjectivity. Indeed, "there are no interacting minds or brains but only interacting living bodies or persons" (Fuchs & De Jaegher, 2009, p. 468). It is because of their less reductive understanding of intersubjectivity that Fuchs and De Jaegher believe their account to be more in alignment with phenomenology than mirror neuron accounts alone.

IV. An Enactive Account

Now we shall return to the idea of 'mutual incorporation', which Fuchs and De Jaegher (2009) describe as the reciprocal interaction of two embodied agents such that "their body schemas and body experiences expand and, in a certain way, incorporate the perceived body of the other" (p. 472). In order to begin a discussion of mutual incorporation, one should first develop an understanding of 'unidirectional incorporation', which describes the way in which objects or instruments become extensions of one's body schema. Unidirectional incorporation is an idea attributed to Merleau-Ponty who provides several notable examples, including the blind man whose stick "has ceased to be an object for him, and is no longer perceived for itself" (Merleau-Ponty, 1962, p. 165). In this example, the hand of the blind man feels *through* the stick and is guided by the ways in which that stick (of a certain shape and dimension) interacts with the environment as he moves it. There is thus an intimate connection between sensation and movement such that organism and environment co-constitute each other.

With this unidirectional incorporation comes 'operative intentionality'¹², which Fuchs and De Jaegher (2009) interpret as "the prereflective meaningful connection that the body establishes with its environment, based on the inherent connection of perception and action" (p. 475). This is a kind of Merleau-Pontean sensorimotor coherence – for example, the way in which a tennis player's body coordinates with the incoming ball, allowing her arm to respond to the call of the ball, or as Merleau-Ponty might say, the being-towards-the-ball through the body. The authors claim that such connection can be attained not only with inanimate objects, but also with other individuals, so that the observer becomes fascinated by the performer, and the observer's lived body can be described as 'being-towards' the other. Like the blind man's stick, the other is subsumed into the observer's lived body as distinctions of embodiment disintegrate and

¹² "The concept of operative intentionality (*fungierende Intentionalität*) found only in the form of mere hints in Husserl's later writings has been made much of by later phenomenologists. In fact, one may say that all the above concepts of intentionality – the concepts of passive synthesis, genetic constitution, horizon intentionality, anonymous intentionality and unconscious intentionality – are brought together in the last papers under the title 'operative intentionality'" (Mohanty, 2005, p. 15).

‘operative intentionality’ shifts towards that of the other: “For a moment, we might not even distinguish his movements from our own any more, and the ambiguity of incorporation gets lost” (Fuchs & De Jaegher, 2009, p. 474).

Finally, this idea can be extended to ‘mutual incorporation’ by which, as the term suggests, there is “reciprocal interaction of two agents in which each lived body reaches out to embody the other” (Fuchs & De Jaegher, 2009, p. 474). In this way, the coordination between the two embodied subjects (movements, utterances, gestures, gazes, etc.) draws together each individual operative intentionality in such a way that meaning is co-created through this joint interaction that would otherwise cease to exist for each individual.¹³ As such, the intersubjective relation is not seen as a simulation nor as an individualised or mentalised process, but as the result of the coordination between two lived bodies, where both are mutually perceiving and perceived as well as acting and being acted upon (Fuchs & De Jaegher, 2009, p. 477).

IV. Husserl and Enactivism

Thus far, we have established that the conclusions derived from mirror neuron research may not be as compatible with Husserlian descriptions as initially thought. We have also considered Fuchs and De Jaegher’s position as to why an enactivist account offers a more thorough, and specifically, a more phenomenological understanding of intersubjectivity than mirror neurons. Now, in this final section, we will assess whether the enactive account is indeed more consistent with phenomenology, at least according to a Husserlian phenomenological tradition. That is, we will see if enactive intersubjectivity is able to overcome Zahavi’s four points of criticism where mirror neuron accounts fail to adhere to a Husserlian understanding of empathy.

To Zahavi’s first criticism regarding the explanatory scope of mirror neuron research, this concern is exactly in line with the enactivist approach. It seems reasonable to assume that neither Husserlian scholars nor the aforementioned enactivists would target their primary criticisms at the empirical results themselves, but both would surely question the interpretation of such results in explaining intersubjectivity. To quote Fuchs and De Jaegher (2009), “...such explanations single out *one section only* of the whole circle of organism-environment interaction. They fail to address social interaction as a structured and structuring process which in turn influences brain functions” (p. 469). While the authors maintain that the link between perception and action demonstrated in mirror neuron research may be important for social understanding, they acknowledge that a mirror neuron system could only function within the context of embodied and meaningful experiences and interactions. As such, this embeddedness must also be given explanatory value. Likewise, Husserl appreciated the complexity of interpersonal understanding and acknowledged that various empathetic levels are at play when shaping our perception of the other, and accordingly, ourselves and our world. Of course, Husserl never had the opportunity to write on mirror neurons, but it seems one could safely assume mirror neuron studies would be bracketed in his epoché along with the rest of the scientific data of his time. That is, for Husserl as well as for the enactivists, the phenomenological description is not a mere consequence of scientifically-discovered biological mechanisms but is the appreciation of the embodied being as situated within a framework in which meaning is constituted not only at the level of another’s actions, but also at the level of one’s relations to the world as well.¹⁴

Zahavi’s second criticism results from the resemblance of mirror neuron system descriptions to

¹³ For example, shared laughter.

¹⁴ There is, however, an important distinction between the accounts whereby according to the participatory sense-making of enactive intersubjectivity, meanings are “emergent products of interaction, and in many situations, they can be viewed as distributed phenomena rather than as individual, private mental acts or properties” (Fuchs & De Jaegher, 2009, p. 480). In contrast, Husserl maintains that one’s experience of the other works to constitute one’s experience of herself and her world in such a way that Husserl is sometimes accused of being too idealistic and solipsistic. While this is an important concern (and will be acknowledged in the concluding section of this article), the comparison discussed in this first point holds insofar as both Husserlian and enactive descriptions of intersubjectivity require an appreciation of the worldly embeddedness of the self-other relation and a broader explanatory scope than mirror neuron accounts alone can provide.

simulation theory or even a form of projectionism. Fuchs and De Jaegher (2009) address this idea in a footnote, stating, “Although there may be an element of imitation, fascination does not imply simulation” (p. 474). They refer to an example in which an observer watches an acrobat¹⁵ with *fascination*: “Our lived body reaches toward and ‘conjoins’ with the acrobat’s swinging movements – we may even be prompted to co-movements” (Fuchs & De Jaegher, 2009, p. 474). Still, this is not to say that observing the acrobat leads to the ascription of a mental state to the acrobat from the observer. For the enactivist, it is a process by which “the centre of the ‘operative intentionality’ of our body shifts towards that of the other” (Fuchs & De Jaegher, 2009, p. 474), and the resulting empathy is not so much an internal simulation or projection, but is the result of an entwinement between self and other.

Returning to Husserl, we see a similar idea, where empathy is not a reproduction of the other nor is one’s understanding of the other’s experience contingent upon an analogous experience in the observer:

“[Every I] regards the [other] lived bodies as ‘bearers’ of I-subjects. But it ‘sees’ the other I’s not in the sense that it sees itself or experientially finds itself. Rather it posits them in the manner of ‘empathy;’ hence other lived experiences and other character dispositions are ‘found’ too; but they are not given or had in the sense of one’s own” (Husserl, 2006, p. 5).

Although Husserlian phenomenology emphasises that my own embodied self-experience is necessary for the apperception of the other, it is through the other that the apprehension of my own body as an object is acquired (Zahavi, 2011, p. 245), as well as the lived-world being for the other. Thus, “as Husserl proceeds to point out, I am not what I am for myself, independently of the other, nor is the other independent of me. Everybody is for himself and at the same time for the other in an inseparable being-for-one-another” (Zahavi, 2011, p. 245). This seems consistent with the enactivist description, where “interactional social understanding is not an inner modelling in a detached observer, but on the contrary, the other’s body reaches out to my own, and my own reaches out to the other” (Fuchs & De Jaegher, 2009, p. 475). In essence, both Husserl and the enactivists reach the conclusion that the intersubjective relation is not one of “ineffective mirroring (*kraftlose Spiegelung*),” but rather, “the being of self and other are constitutively intertwined (Hua 15/191)” (Zahavi, 2011, p. 245). This intertwinement, consistent with Merleau-Ponty¹⁶, is also, therefore, rooted in Husserlian empathy.

To Zahavi’s third criticism, of which there are two parts, both are easily in line with enactive intersubjectivity. The first criticism is that ‘mirroring’ is too static of a concept. Fuchs and De Jaegher address this through their incorporation of dynamical systems theory, which is essentially a mathematical tool used to describe change in real time. Thus, the assumption that the intersubjective relationship continually unfolds in real time is implicit in their use of dynamical systems. In this case, unfolding in real time means that the changes that occur are not simply unidirectional cause-and-effect mechanisms but involve reciprocal and constantly evolving interactions between two beings. According to Fuchs and De Jaegher (2009), this interaction includes behaviour as well as the retention of past experiences and the protention of future experiences (p. 476).¹⁷ Ultimately, enactivism agrees with Husserl’s demand for a dynamic description, and Fuchs and De Jaegher’s account portrays the intersubjective relationship in anything but static terms.

In the second part of the criticism, Zahavi presents the issue of maintaining ‘otherness.’ He claims that Husserl had greater respect for the preservation of ‘the other’ than is seen with many mirror neuron accounts. However, this difficulty is also overcome in the enactivists’ model. Indeed, if we look at enactive intersubjectivity, we see that ‘the other’ is a necessary foundation for their claims of mutual incorporation: “Mutual incorporation implies a component of autonomy and otherness that is absent in unidirectional incorporation. The experience of even slight mismatches or unforeseen reactions suffices to establish a

¹⁵ In *Grundlegung der Ästhetik*, Theodore Lipps (1903) uses the acrobat as an example of empathy through internal imitation, though unlike Fuchs and De Jaegher (2009), Lipps is often associated with simulation theory (p. 474). See Zahavi (2010) for further discussion on Lipps and phenomenology.

¹⁶ See Merleau-Ponty (1968).

¹⁷ These terms can be traced to Husserlian texts, with retention and protention comprising significant aspects of Husserl’s writings on temporality. See Husserl (1991).

difference between self and other” (Fuchs & De Jaegher, 2009, p. 475). The authors describe how mutual incorporation partially decentres one’s embodied operational intentionality. Notice, they claim only a partial decentralisation, for they believe there to be a continuous oscillation between self and other, between activity and receptivity. “In order to understand the other *as other*, empathy has to be balanced by alterity” (Fuchs & De Jaegher, 2009, p. 476). We can now see that the maintenance of ‘otherness’, while perhaps overlooked by many mirror neuron descriptions, plays an important role for the enactivist. In fact, mutual incorporation requires the idea of ‘the other’ as a point to oscillate to and from. This shows some similarity to Zahavi’s interpretation of Husserl that the original givenness of my own lived body (*Urleib*) is not projected onto others, but rather, serves as a ‘contrast foil’ by which others can be experienced as others: “To put it differently, the other might be a self in his/her own right, but the other can only appear as another for me in relation to, and in contrast to, my own self-experience. But in this case, my self-experience doesn’t constitute the model; rather it is that against which the other’s difference can reveal itself” (Zahavi, 2011, p. 240).

Finally, regarding Zahavi’s last criticism, it should now be clear that the enactivists’ description of intersubjectivity has been at the level of the subject or person and has described the interaction of lived bodies not only as embodied beings, but as subjective beings situated in and engaging with an environment. Again, this does not mean that to adhere to an enactivist account, one must reject the science behind mirror neurons. It simply demands the limitation of the explanatory value of mirror neuron research. After all, brain functioning can certainly influence the dynamics of the enactivist model, but the central point is that a phenomenologically accurate account of intersubjectivity requires descriptions of dynamical interactions not only at the level of a brain in a body, but also as a person in the world.

Conclusion

One intent of this article is to assess whether an enactivist account of intersubjectivity is phenomenologically superior to mirror-neuron-based accounts insofar as it is able to overcome Zahavi’s criticisms of the latter. I believe we can safely conclude that, yes, the enactivist account is able to overcome these issues, and thus, is more in accordance with phenomenology, at least when it comes to a Husserlian understanding of empathy. This leaves us with two conclusions:

First, Fuchs and De Jaegher’s descriptions of intersubjectivity rely heavily on the work of Merleau-Ponty, but Husserl is neither mentioned nor listed as a reference in the authors’ twenty-one-page publication.¹⁸ What this article hopefully indicates is that the works of Husserl can and should be cited, for a great deal of Merleau-Ponty’s descriptions of intersubjectivity can be traced back to Husserlian origins. Of course, there are reasons to exclude Husserl (e.g., his idealistic tendencies and subject-object distinctions), and his own phenomenology should not be equated with that of Merleau-Ponty. Nevertheless, intersubjectivity is a topic essential to Husserlian thought, and his collected works provide a strong foundation for defining phenomenological perspectives of empathy. This article has shown that much of the enactivists’ account is compatible with Husserl’s descriptions of intersubjectivity – indeed, far more so than accounts provided by mirror neuron research – so to exclude Husserl from the discussion is to do a disservice to their account. Even if fundamental differences exist between the two descriptions, the overlap between Husserl and enactivism seems sufficient and significant enough to mention and discuss.

Second, and more relevant to the scientific community, the enthusiasm observed for mirror neuron research should not result from the ability for such research to explain phenomenological descriptions of intersubjectivity. Indeed, not only does such research fail to explain these descriptions (such as those provided by Husserl in his writings on empathy), but this research struggles to be in accordance (or not in accordance) with a phenomenological approach at all, for it describes intersubjectivity at an entirely

¹⁸ Edith Stein, who expanded upon much of Husserl’s work on empathy, was not mentioned either. These observations are particularly relevant to Fuchs and De Jaegher (2009) who claim a phenomenological perspective, which is why we have focused on this article. Other publications, such as De Jaegher and Di Paolo (2007), do not commit themselves so strongly to phenomenology, though similar parallels might be drawn between their enactive descriptions and Husserlian phenomenology.

different level of understanding. As such, if it is to be given explanatory value, mirror neuron research should resign any claims to provide a foundational understanding of social cognition, and instead, work to be contextualised within a broader framework – one that is able to accommodate phenomenological descriptions. From what we have seen, the enactivist account provided by Fuchs and De Jaegher should certainly be a candidate for this contextualisation, as it permits a vocabulary and understanding largely consistent with the phenomenological descriptions of Merleau-Ponty and Husserl. At the same time, their enactive account could accommodate the discovery of mirror neurons by showing the role of neuronal conditions in influencing the state space of the dynamical system, a system that facilitates descriptions at the level of the lived and situated body.¹⁹ Moving forward, one should continue to scrutinise Fuchs and De Jaegher’s account in phenomenological terms (i.e., assess its relationship to other phenomenological descriptions²⁰) as well as explore alternative accounts to intersubjectivity that appreciate these various phenomenologies.²¹ To be sure, determining the proper context with which to frame the continuously evolving mirror neuron research will prove to be a challenging endeavour, but the hope remains that this task will be pursued with the continued intellectual vigour as was seen with the advent of the discovery of mirror neurons.

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¹⁹ Such an account would be in accordance with Thompson & Varela (2001), however, one should be careful regarding claims to naturalise phenomenology – Fuchs and De Jaegher (2009) do not subscribe to this endeavor (p. 470).

²⁰ Zahavi (2001) might be useful in this regard, for he discusses intersubjectivity in the works of Scheler, Heidegger, and Sartre as well as Husserl and Merleau-Ponty.

²¹ For example, Depraz (2001) discusses how empathy as described by Husserl and empirical second-person accounts can influence each other. Likewise, Gallagher (2012) has provided an overview of empathetic views “consistent with phenomenological and scientific evidence,” and has advocated the inclusion of narrative competency in accounting for intersubjectivity (p. 190-191). On the other hand, Thompson (2001) has continued Francisco Varela’s push for a contemplative ‘science of inter-being’ as a way of integrating cognitive science and phenomenology as well as contemplative Eastern traditions.

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