IS INTERACTION JUST A DYNAMICAL PROCESS?

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ABSTRACT. In this article I argue for a pluralistic vision of interaction and social cognition in general: we should imagine the landscape of types of interactions as a line segment whose ends represent radical positions (purely inferentialist or purely simulationist theories on one end and radical embodied cognition on the other) on which different types of interactions fall. The closer to any extreme a particular type is, then the more likely it is to be better explained by the theory the extreme point represents. In order to delineate the controversy that stems from different conceptualizations of the same phenomenon and to articulate my position, I criticize Gallagher's radical claims of embodied cognition as constituting social interaction. The main point that I make regarding his theory is that, even though it provides a satisfactory explanation for types that correspond to motor-perceptual processes, it only manages to metaphorically describe cases of interaction that involve articulated language use and, generally, semantically charged actions. Given that a serious researcher should be interested in accurate predictions or descriptions, it follows that Gallagher's account is not all-encompassing, and, given the many virtues of other theories, we should adopt a pluralistic point-of-view.

Keywords: social interaction, social cognition, interaction, enactivism, embodied cognition, dynamical systems, theory of mind, simulation theory

Gallagher has recently argued for a view of interaction as "a mutually engaged co-regulated coupling between at least two autonomous agents, where (a) the co-regulation and the coupling mutually affect each other, and constitute a self-sustaining organization in the domain of relational dynamics"[1]. In his account, for most cases, the relational-dynamics approach exhausts the cognitive

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[1] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 99.

performance, meaning that there is no need for postulating propositional contents, mental states, or beliefs, that exist inside the head of the interlocutor. In addition, de Jaegher et al. posit that social interaction, as defined above, puts "social cognition back where it belongs: between individuals and not inside their heads"[2]. According to what Gallagher calls Interactive Theory, "instances of theoretical inference or simulation that target mental states per se are rare relative to the majority of our interactions."[3]. While I agree that some of our interactions can be captured by relational-dynamics, I argue that mental states should not be taking a secondary role in explaining interactions. Rather, different levels of explanation relative to a concrete situation should be employed in studying interaction. On this account, explanations that differ in level will vary in specificity and appropriateness. The core argument that I am making is based on similarities between the relational-dynamics and theory of mind approaches, and a similar debate taking place in cognitive science between dynamical-systems based approaches and classical representationalist accounts. As Markman & Dietrich argue, "the classical approach to representation must be extended, but not replaced"[4] – similarly, the classical theory of mind approach to interaction must be extended, but not replaced. This differs from Interactive Theory (IT) in the following respect: explanations involving mental states should not be regarded as a tool for, mostly, analyzing exceptional cases of interaction (IT sees theory of mind as a strictly opposed model, rather than complementary to or interwoven with itself), rather, they should be employed so as to make sense of cases of more complex interaction, cases which we encounter on a frequent basis and require an appeal to know-that. There are, however, two challenges to overcome if, as I suggest, the theory of mind approach is to be extended: The Narrative Practice Hypothesis and Direct Social Perception. In this essay, I suggest a way to elude these challenges which consists in viewing most mental states (emotions do not figure in this) as being a finite set of coherent beliefs that each agent co-engaged in an interaction possesses. Far for being a form of know-how, practical in nature, the "web of belief" is 1) theoretical and 2) coherent. Drawing on Quine's and Ullian's "The Web of Belief", I argue that positing beliefs that lie in an agent's head is a better explanation of some quite common cases of interaction that require higher-level processes in order to make sense of the agent's intentions, reasons, emotions, etc. My thesis goes as follows: social interaction, as

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[2] de Jaegher, H., di Paolo, E., & Gallagher, S., "Can social interaction constitute social cognition?", *Trends in Cognitive Sciences*, 14(10)/2010, 446.

[3] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 98.

[4] Markman, A. B., & Dietrich, E., "Extending the classical view of representation.", *Trends in Cognitive Sciences*, 4(12)/2000, p. 475.

defined by Gallagher, is to be viewed as a low-level process that corresponds to concrete, know-how situations, whilst the theory of mind account of interaction is to be viewed as describing a high-level process complementary to or interwoven with social interaction, corresponding to more abstract, know-that situations. The first section of this paper briefly summarizes Gallagher's Interaction Theory. Emphasis will be placed on the more problematic tenets, such as the reliance upon the dynamical systems theory from cognitive science, as much of the argumentation that will be laid out in section II will be targeting those points. In section II I will formulate a few objections to IT. Section III deals with possible responses that an interactionist may have, and section IV contains some final remarks.

I. Interaction Theory and interaction

Let us examine a typical example of an interaction between two agents. For the sake of the argument, we'll assume that, when studying this phenomenon, we use Theory of Mind principles, and that this method is the way most of the people interested in researching interaction go about studying it. I meet my friend at the bus station. We make eye contact and I infer from this, in conjunction with the knowledge that I have of people in general, that he wants to talk to me. We exchange a few lines, then a bus with the number "33" displayed on the window stops next to us. Knowing that this is the bus that goes by his house I deduce that he will want to get into it. Now, our typical example of interaction may go in two different directions: either 1) the inference is correct, and the interaction ends, or 2) my inference has failed, and the interaction continues. In the second case, I might even begin to ponder why he did not take the bus: maybe my friend had different plans, of which I had no knowledge, or he really enjoys the conversation and wants to catch up more. No matter the real *cause* of his actions, we may begin to notice a pattern emerging in the way I engage with my friend in this hypothetical case. On the surface, from a third-person perspective, I may seem like I am engaged in the interaction, but, from my point of view, I take an "observational stance"[5]. That is, I observe my friend acting, and from this, I deduce his mental states. His visible actions, his behavior, *depend* on his beliefs, emotions, etc. The picture described here views the mind as something "hidden away and inaccessible to perception"[6]: in order to get to them, I must engage in an extra-perceptual process of inferring.

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[5]   Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 71.
[6]   Ibid., p. 73.

My social skill depends on the effectiveness of my strategy, or, in other words, the theory of mind that I use. This theory consists of abstract general rules and principles, the likes of: "when X does Y, he is angry", or "if X does Y, he acts on a belief Z". As a consequence, the sense data that are given to me as an input, are meaningless unless I interpret them, in a *homuncular* fashion. In all if not most of my interactions I form a representation of the one that I am interacting with, I establish the representation's meaning in relation with other representations I have, and under the guidance of the Theory of Mind, I make an inference, a prediction about the mental states of the other.

This account may or may not be an accurate representation of the actual way a theorist[7] analyzes a typical example of interaction. In section II, I argue that this is a straw man. As of now, I hope that it seems highly implausible. It would seem, as Gallagher notices, that "on this view, interaction is not a solution but simply another way to state the problem of other minds"[8]. The problem identified here is that the above-described picture frames interaction as a way of two ontologically opaque minds trying to exchange information "across the seemingly thin air of an unbridgeable gap"[9]. In order to refute this view, Gallagher will adopt a dynamical systems theory. The dynamical systems theory emphasizes time: van Gelder held that "details of timing (durations, rates, rhythms, etc.) are critical to a system that operates in a real body and environment"[10]. Likewise, Gallagher considers time as internal to action and, *in extenso*, to interaction: "action shares the same intrinsic temporal structure as consciousness and perception, and more generally, cognition"[11]. One "feature" of this theory is that information need not be stored in discrete representations. Two dynamical systems engaged in an interaction need not exchange representations over an unbridgeable gap: "there is no representation passing"[12], rather, the systems are coupled, so a change in system 1 is simultaneously reflected by a change in system 2. With no need for discrete representations, the homuncular aspect becomes superfluous. The meaning will need to be accounted for in a different way, by appealing to the notion of "affordances": "Affordances are relational; they do not describe objective features of the environment unrelated to

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[7] I use "theorist" to refer to the individual who employs a theory of mind. For the purposes of this essay, the term is used to indicate a theory-theory approach.

[8] Ibid., p. 99.

[9] Ibid., p. 99.

[10] van Gelder, T., "What Might Cognition Be, If Not Computation?", *Journal of Philosophy*, 92(7)/1995, p. 379.

[11] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 34.

[12] Eliasmith, C., "The third contender: A critical examination of the Dynamicist theory of cognition", *Philosophical Psychology*, 9:4/1996, p. 445.

the particular agent involved. An affordance specifies a relation between an agent and some aspect of the environment."[13]. In Gallagher's enactivist view, each action carries along its circumstances, the sum of which make up the action's context. An action is best understood at its highest realized affordance level which is "the highest semantic or functionally useful level of behaviour"[14]. To paraphrase a famous example, one could describe my action as simply moving my arm up and down while, on the highest semantic level, my action is defined by the fact that by moving my arm up and down I pump poisoned water into a household. Cognition is *for action*: "When I see your action I see it as an affordance that motivates my own action—your action is perceived as something that I can respond to, and that is a good part of precisely how I understand your action."[15]. A core tenet of Gallagher's enactivist view is entailed by this theoretical commitment to perceiving affordances: Direct Social Perception. DSP, for short, refers to the process of being able to perceive an agent's mental states *in action*. To illustrate: if a man approaches me with his cheeks slightly turned red and a frowning expression I **see** that he is angry, and I need not infer, via an extra-perceptual process that he is angry. There is an affective component to DSP: seeing the angry man I am in a certain sense affected by this perception.

Besides DSP, which, in theory, is sufficient to explain a lot of aspects relating to interactions, the interactionist has another tool at his disposal. The Narrative Practice Hypothesis states:

> that direct encounters with stories about reasons for acting, supplied in interactive contexts by responsive caregivers, is the normal route through which children become familiar with both (i) the core structure of folk psychology and (ii) the norm-governed possibilities for wielding it in practice, knowing how and knowing when to use it.[16]

DSP may not be able to account for more complex interactions, and this is precisely the role that NPH is supposed to fill. By framing my particular knowledge of my friend in a narrative, I am able to make sense of his reasons for not taking the bus. Emphasis is placed here on 1) the fact that narratives are not theoretical bodies of knowledge and 2) on the fact that "we learn from narrative practices how to frame an understanding of others"[17]. 1 is meant to convey that narrative practice, as its

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[13] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 10.

[14] Ibid., p. 17.

[15] Ibid., p. 117.

[16] Hutto, D. D., *Folk Psychological Narratives: The Sociocultural Basis of Understanding Reasons*, MA: MIT Press, 2008, p. 117.

[17] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 167.

name suggests, is not a form of know-that, but rather a form of know-how. I know how to make sense of someone's action from the context in which it is realized. I do not need an inference and a general principle so that I could deduce someone's mental state expressed in their particular action. 2 makes explicit the fact that I do not literally and consciously make up a narrative for every single friend that I have or every single person that I interact with. I implicitly frame someone's actions in a narrative, because that is how I know how to make sense of their reasons for acting.

We may now define interaction as a "co-regulated coupling between at least two autonomous agents, where: (i) the co-regulation and the coupling mutually affect each other, constituting an autonomous self-sustaining organization in the domain of relational dynamics and (ii) the autonomy of the agents involved is not destroyed"[18]. (ii) simply eliminates cases where the interaction is heavily one-sided: for example, the "interaction" between a master and a slave. Although NPH and DSP are not explicitly mentioned in this definition, their presence is implied by (i).

II. Raising a few problems

At this point, IT may look as though it is quite an elegant description of our day-to-day interactions, at least on the surface level. It seems rather intuitive that our interactions are mostly the result of immediate know-how, as though we can talk of a "tango of communication"[19]. Also, it seems obvious that our body shapes, in a certain sense, the way we carry out our interactions. I do not think of myself, or of others, as a brain-in-a-vat: certain gestures, certain glances, can restructure the meaning of the whole situation. We act according to the affordances our environment provides, so the context of our actions it's highly important to the semantic side of our interactions. A hug from my best friend changes its meaning when it is realized in a casual situation, at the bus station, from an exceptional case, at a funeral. Given all this evidence, why am I still not convinced?

Let us first look at the more radical claim of IT. It states that the study of social cognition has been done in an improper way and that we should reconsider the fundamentals of our methodology, as the picture in question does not accurately represent the way individuals understand each other, through interaction. Namely, methodological individualism, and its correlatives, the theory of mind approaches, need to go. But one should note that this claim rests on the premise

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[18] de Jaegher, H., di Paolo, E., & Gallagher, S., "Can social interaction constitute social cognition?", *Trends in Cognitive Sciences*, 14(10)/2010, 442.

[19] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 157.

that interaction has actually been improperly understood by the theorist. The premise holds if Gallagher's account of interaction is an accurate description, and so we should investigate his arguments in order to correctly assess IT and integrate it into the larger picture of interaction and social cognition.

First, what does it mean that behaviour co-constitutes a mental state? Walter argued that the debates between classic approaches to cognition and embodied or situated approaches revolve around two main problems: 1) the locational delineation problem and 2) the relational delineation problem[20]. The first one refers to the topos of the mind, where is it located, and the second one refers to the relation of either causal dependence or constitution that defines cognition and extra-cranial processes. We can see that Gallagher makes two important claims: 1) that the mind is located in a second person, that is, always in a set of circumstances that are extra-cranial and 2) that mental states are co-constituted by embodied behaviour. That means that he leans on the radical side of the debate. As such, he would not be satisfied by integration of DSP into the theory of mind for example, because it denies him the relational claim, and probably also the locational one. I will explore the multiple problems that arise out of his commitment to dynamical systems and the notion of "affordance", and I will argue that it his radical position is unappealing as a whole. The interactionist would still have a word to say, as types of interactions involving low-level processes, such as dancing and some aspects of more complex interactions (such as an agent raising his tone) seem to be better described as dynamical, rather than inferential or simulationist.

Second, Gallagher considers that, from the theory of mind approach point of view, one typically assumes that mental states are hidden peculiar entities, that can only be accessed via a process of inference. This is the assumption that is supposed to rule out DSP and NPH as viable ways of reaching those mental states. But I think that this ruling out is not entailed by the theorist's convictions. The theorist is not committed to actively inferring mental states all the time, in all contexts, as though he is realizing a computer algorithm. When I'm at a restaurant I do not need to infer the mental states of the waiter that is coming to take my order. And, indeed, there are many such cases that are uninteresting for mindreading. A good, second example, is that the theorist need not infer the mental states of other drivers in traffic. The fact that this is the case is neither an argument against mindreading, nor an argument for the interactionst, as these may as well not be interesting cases of interaction at all. One may argue that they don't even qualify for proper interactions as, at least in the case of the waiter, the affordances

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[20] Walter, S., "Situated Cognition: A Field Guide to Some Open Conceptual and Ontological Issues.", *Review of Philosophy and Psychology*, 5(2)/2013, p. 251.

of a human waiter are in no way different from the affordances of a computer program that would realize the same function. The waiter is simply a tool to fulfill a purpose. Seeing people as tools, as fulfilling social roles is a recurring motif throughout Gallagher's theory. Moreover, as Overgaard and Michael note, the theorist may not be locked out of the option of perceiving the other's mental states, as they are expressed in his actions[21]. The "inference" may be a sub-personal mechanism or process, rather than a consciously realized process. The fact that cognition is "for action" may simply be restated as the trivial truth that "perceptual and cognitive systems evolved to maximize survival, just like circulatory and digestive systems"[22]. In this sense, someone's behaviour expresses a mental state, that is ontologically located in his "head", and the behaviour *depends* on the mental state existing there. This is a claim that will likely not sit well with an interactionist, as his radical departure from theory of mind approaches is precisely that the behaviour *constitutes* the mental state and, as such, it is ontologically dis-located: extra-cranial and not intra-cranial. But I shall return to this point in section III.

Third, Gallagher points out that the theorist takes an observational stance towards interaction, and this is precisely the reason why it fails to grasp the relational dynamics that constitute it. But what does an observational stance actually mean? Does it necessarily mean that one is not engaged in the interaction? Overgaard and Michael give the example of a first date, in which usually one is actively trying to mindread the other person[23]. One important thing to note concerning this example is that, despite being in what Gallagher would call an observational stance towards the other, this does not rule out the dynamic dimension of the interaction. You could still directly perceive some intentions, emotions, etc. And it seems as though you are still engaged in it. Even more so: it's significantly more engaging than a casual conversation in a bus station. If this is the case, then two assumptions are challenged: 1) that we can be in just one stance at a time, or, to be more precise, while interacting, we can be in just one stance, be it either a first-person engaged one, or a third-person observational one; and 2) the observational stance rules out any dynamical aspect of an interaction.

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[21] Overgaard, S., & Michael, J., "The interactive turn in social cognition research: A critique.", *Philosophical Psychology*, 28(2)/2013, p. 165.

[22] Goldinger, S. D., Papesh, M. H., Barnhart, A. S., Hansen, W. A., & Hout, M. C., "The poverty of embodied cognition.", *Psychonomic Bulletin & Review*, 23(4)/2016, p. 963.

[23] Overgaard, S., & Michael, J., "The interactive turn in social cognition research: A critique.", *Philosophical Psychology*, 28(2)/2013, pp. 171-172.

Moreover, the theorist is said to be committed to a claim of universality. That is, our primary and pervasive way of understanding others is by mindreading them. Whether the theorist is actually committed to a claim of universality, or whether he can discard it at no expense is irrelevant. I don't think we can arrive at a clear-cut, definitive, and universal answer in this matter. The problem resides in the fact that experience differs from individual to individual. Some may resort to mindreading more often than others. One unlucky individual may have first dates quite often and so, will find himself mindreading most of the time. A salesman may employ a theory of mind strategies in order to persuade potential buyers into making a purchase. That is not to say that he will not engage in dynamical relations with his friends or family. What I'm getting at is that the point is not which way of interacting is representative of the majority of our interactions, since interactions vary in complexity. A serious researcher, I think, will be more interested in studying different types of interactions and, in doing this, different methodologies will vary in appropriateness. I don't think that casting aside mindreading as a marginal, exceptional, and peculiar way of understanding others does justice to the study of interaction. It certainly holds as a rhetorical strategy, but not much more. And this account needs much more than rhetorical hocus-pocus in order to be convincing.

We will now look at more technical aspects of Gallagher's theory. In particular, I want to raise a few problems regarding the relational dynamics approach, and regarding the semantical aspect of the "agentive situation"[24]. It is a feature of the dynamical approach that the boundaries separating agent from environment are blurred. This has led some to see this as "the problem of the systems boundaries"[25]. The main concern for Eliasmith is that, in terms of a research program, the dynamicist, due to the fact that he sees cognition as embedded, is unable to provide a viable model for it. The huge amount of factors involved in the cognitive process and, by extension, in the interaction process (cultural norms, values, various affordances, etc.), forces the dynamicist to use collective parameters. And because of the fact that collective parameters must be readjusted with every run of the experiment, initial conditions are hard to specify, and the result is constrained, rather than arrived at[26]. A similar point of view, related to embodied cognition (not specifically to dynamical systems but still appliable) is held by Goldinger et al.

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[24] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 13.
[25] Eliasmith, C., "The third contender: A critical examination of the Dynamicist theory of cognition", *Philosophical Psychology*, 9:4/1996, p. 451.
[26] Ibid., pp. 451-454.

> More critically, although the EC hypothesis motivates many experiments, it appears extremely challenging to incorporate into a formal model and is therefore limited to broad, qualitative predictions. How might we write an equation that expresses embodiment? How can the environment (such as the affordances of various objects) be parameterized?[27]

What I am getting at is that "the starting problem"[28] may not be so easily avoided by the interactionist. The argument that I'm making is not that in our day-to-day interactions we are not able to determine the relevant factors – that would be absurd. I am simply pointing out the fact that the dynamical approach may have a hard time determining the relevant factors, and this means that the interactionist *explanation* of the phenomenon in question may not be able to specify what is relevant. We should distinguish between the phenomenon *per se* and a theory that tries to explain it. The dynamical explanation can still *feel* like a pertinent one, but this may be owed to the fact that it is an all-encompassing metaphor, as Eliasmith would suggest: "It simply makes sense to think of the behavior of cognitive systems in terms of an "attraction" to a certain state (e.g. some people seem to be disposed to being happy)."[29]. But the metaphorical description is of no use if it cannot provide some new insight into the phenomenon described. Nevertheless, we must stress the fact that it may be the case that some interactions are best described as dynamical, such as a dance of tango (generalizing, there is no requirement of representation passing and no requirement of homuncular interpretation or manipulation of symbols). But this does not entail that more complex types are also best described as being dynamical, such as a heated discussion between friends at a bar (language and meaning seem to be harder to account for in a dynamical framework). Gallagher might bring up the distinction between know-how and know-that ascriptions of knowledge in order to dispel the objection that his theory is, at best, metaphorical. But we should emphasize that these *are* ascriptions of knowledge: we ascribe types of knowledge to the people whose behavior we observe (it is not a feature intrinsic to the activity being employed). And it is not the case that it is a clear-cut distinction[30]: we can speak of some students as knowing-how to talk to the principal in order to get out of a bad situation, but certainly, this

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[27] Goldinger, S. D., Papesh, M. H., Barnhart, A. S., Hansen, W. A., & Hout, M. C., "The poverty of embodied cognition.", *Psychonomic Bulletin & Review*, 23(4)/2016, p. 964.

[28] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 76.

[29] Eliasmith, C., "The third contender: A critical examination of the Dynamicist theory of cognition", *Philosophical Psychology*, 9:4/1996, p. 460.

[30] Snowdon, P., "Knowing how and knowing that: A distinction reconsidered", *Proceedings of the Aristotelian Society* 104 (1)/2004, p. 26.

involves knowing-that the principal likes to be complimented. Therefore, invoking this distinction does not elude the challenge of proving that the dynamical explanation is not just a metaphor.

The interactionist would try to argue that precisely because he sees the agent as embodied and situated, he can determine the relevant aspects of interactions in terms of environment and context. I think that there are many problems to be addressed here. First, we should note that the relationship between situation and agent is one of co-constitution, mereological in nature. We may see the agent as a part that relates to the whole of the situation. A change occurring in the agent is reflected simultaneously in the situation. This is probably the reason why Gallagher takes the observational stance as being fundamentally disengaging in an interaction. Because it threatens the coupling aspect of the systems and makes place for discrete representations, or mental states. That is, *his own premises* that specify the dynamical constitution rule out an intuitive aspect of the phenomena being studied, and this does not seem to call for a reevaluation of the observational stance, as it seems to be a weakness on the theory's part.

III. In-discrete semantics

The interactionist might say that, even as a sub-personal process, inference is not the way people actually, and *truly understand* each other, and that thinking of DSP as something compatible with theory of mind approaches is a reductionist move: "to the extent that the theory theorist would treat the perceptual aspect as merely phenomenal or, indeed, epiphenomenal or banal, direct social perception really plays no significant role in social cognition."[31]. Let us analyze the first claim: that people do not actually understand each other through an inference. Gallagher insists that deducing someone's mental states is an explanation of their behaviour, and not an understanding[32]. But what does *understanding* mean for Gallagher? It seems as though it requires an affective response to the other[33]. The concept of understanding seems to play an important role in what he calls the diversity problem – a simulationist merely projects himself on the other person, failing to account for his specific differences. The theorist isn't able to grasp diversity either: because he uses general, abstract knowledge, instead of particularistic, narrative-

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[31] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 138.
[32] Ibid., p. 72; p. 79.
[33] Ibid., p. 72.

like know-how[34]. This particularity, in conjunction with an affective response, gives us the requirements for something to qualify as an instance of understanding. It is obvious, I think, that these points come as consequences of Gallagher's larger picture of social cognition. The theorist and the simulationist think of social cognition as something wholly solipsistic, due to their commitment to homuncularity, discrete representations, and extra-perceptual processes of inference or simulation. Many objections can be raised against this account, but I'll mention just two of the most important. Keep in mind that what I'm doing by analyzing this concept is trying to see if DSP and NPH can imbue our actions and interactions with meaning(without resorting to representations), and if there are any tensions between their conceptualizations and the conceptual background of Gallagher's theory. First, it is not clear what an affective response actually means and whether one can hold that seeing perception as affecting us can really constitute "true" understanding. Take the example of an angry person rushing toward me. Of course, I will be affected by the perception of their expression and action because I will probably think that I am in danger, although this may not be the case. This does not mean that I *understand* their anger or their action. And no appeal needs to be made to the reason why they are angry, for which I am supposed to frame their actions in a narrative (I can interact with someone at a superficial level, without reference to his reasons or motivations). I simply affectively respond out of fear for self-conservation. Of course, other examples, such as some cases of empathy, may satisfy this requirement. But many other counter-examples can be formulated, which are not particularly exceptional[35]. Also, as Overgaard and Michael point out, some detached third party, an uninvolved observer, might better understand the feelings of my interlocutor, as in the example of a heated debate[36] (Overgaard & Michael, 2013, p. 170). As such, it seems as though the affective response is neither sufficient nor necessary for understanding the other, at least in some not-so-exceptional cases. Second, I find it hard to grasp how particular knowledge about someone, or about contextual factors, is not theoretical. For challenging this view, we have to tackle the NPH.

It is clear that NPH is not meant to be just an account of how we learn to interact with others. Rather, it is a more radical claim, that this is how we actually make sense of others' reasons for acting. Overgaard and Michael pointed out

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[34] Ibid., p. 77.

[35] I might stumble upon my friend who has an angry expression and might conclude that his anger is directed towards some injustice that he has just faced and that I know about. I might even console him, saying that I understand how he feels, yet he might be angry for a whole different reason.

[36] Overgaard, S., & Michael, J., "The interactive turn in social cognition research: A critique.", *Philosophical Psychology*, 28(2)/2013, pp. 167.

the fact that "the sort of understanding children are said to gain [from narrative practice] is not plausibly construed exclusively in terms of knowing-how" (Overgaard & Michael, 2013, p. 167). Gallagher would argue that, when framing Laura's actions in a narrative, I do not make a Laura Theory (Gallagher, 2020, p. 167), and I can understand her reasons as making sense within one of several possible narratives. But I don't think that a theorist would hold this kind of view. And I don't think that taking particular knowledge about someone as theoretical, about my friend John, for example, would mean that I am somehow constructing the John Theory. From narratives, children learn how to make sense of someone's actions, in terms of their reasons for acting. This implies the fact that children, as noted in section I, learn "*that* mental states are connected in such-and-such ways with other mental states and contextual factors"[37]. John might be a very talented fisherman. His knowing how to catch a particular fish certainly consists in, or can be traced back to his knowing that this fish comes out at midday and that he likes a particular bait, and so on. Moreover, it is not the case that only the know-how aspect is important, and that the know-that aspect can be left out. Considering a favorable case, John does know how to use the fishing rod. This knowledge is co-constituted by the fact that he knows that under a certain load it can break. But the activity of using the fishing rod can be hardly said to be reduceable to "know-that", propositional or factual knowledge. It seems as though, on an imaginary line segment, the further away from strictly perceptual-motor descriptions the activity is, the more likely it is to incorporate more propositional aspects (which, in turn, can be better explained in terms of "knowledge-that"). In order to see why the John Theory reply is not problematic, we need to provide a competing picture.

It is not sufficient to critique Gallagher's radical position. It is also important to give a competing account. Gallagher seems to think that it is not plausible that a single mental state can cause someone to act[38]: for example, the mental state of thirstiness is not the cause of my action of going to grab a glass of water. One important mistake is that he conceived this relation as being either one-to-one or one-to-many. One mental state has to do all the job. A better account of our mental states would see them as interwoven, as forming a "fabric" that described their interrelatedness. That is, no one mental state is at play at any time t. Rather, many mental states are engaged in most of our actions, all at once. My action of getting a glass of water is based on my sense data of my surroundings, my belief that this is how I would clench my thirst, my being thirsty, etc. Drawing on Quine's and

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[37] Ibid., p. 8.
[38] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 39.

Ullian's concept[39], we can say that every person has a web of beliefs[40], which is a set of finite coherent beliefs. Coherency does not mean consistency: we may hold beliefs that entail contradictory propositions, and conflict between them is not ruled out. This seems to give an accurate picture of how we often find ourselves in positions in which we have to choose between conflicting viewpoints: believing that, for example, our usual news source is trustworthy or believing that it is not, after our friend debunks one or multiple of their stories. We can see that each option engaged multiple other beliefs, which we must be ready to give up, as a result of choosing one of two options. Getting rid of too many beliefs (some have more weight than others) may cause the whole fabric to dissipate. Two points have to be emphasized: the web of belief is 1) theoretical, and 2) coherent. My belief that John is going to India to see the Taj Mahal is not based on some know-how narrative framework of him. Rather, it is based on other beliefs, for example, the belief that John likes to travel and my knowledge that he is fascinated by Indian history. Other, general principles of folk psychology might justify my conclusion. It is important to note that coherency leaves open the possibility that I, as an agent, might not be entirely consistent, and might often make mistakes[41]. Moreover, the web of belief contains and is therefore influenced by the cultural norms that I've been inculcated with, and they have a much higher weight than sense data (which is the part of the web that can be easily gotten rid of, without much loss, at any one time t). The racist is not so easily persuaded to see people of different races as humans because, if he were to drop his prejudice, a lot more beliefs will at the same time have to be dropped[42]. Likewise, since sense data is peripheral to the fabric, my perception will be influenced by my own already formed biases.

Concerning the John Theory reply, I simply create an abstract model consisting of a set of beliefs, that I think John shares, and try to see what they cohere with. It is not a theory that I am constructing, I just interpret my representation of John, considered as being here and now, with beliefs that may be informed by past experiences, not as some entity in the process of self-actualization. That is, I think of John in the present, at the time t_0 and of his reasons for his acting in a certain way, in isolation from his past development. That past is reflected in the beliefs he holds right

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[39] I do not want to import the concept of the web of belief with all of its conceptual determinations. Rather, I use it as a visual model of how our mental states are related, like they are interwoven and form a fabric.

[40] Quine, W., V., & Ullian, J. S., *The Web of Belief*, McGraw-Hill Education, 1978, p. 41.

[41] We can conceive of emotions as readjusting the weight of certain beliefs. For example, when I am sad I am more likely to evaluate things negatively than I would be in normal conditions.

[42] Gallagher, S., *Action and Interaction*, Oxford University Press, 2020, p. 154.

now. Likewise, when I wonder: "Why is John going to India?" it is not the case that I'm wondering, like an author writing a novel, whether it is plausible that this is how his character develops. I find it more plausible that I just wonder whether his actions are coherent with his other beliefs. If we take a narrative framework to be a frame that links temporal events with each other in a linear fashion (which is a plausible and a charitable interpretation) and expressing a meaning that transcends this temporal dimension, embedded in the character's development, it seems as though this position is in tension with the dynamical side of interactions that Gallagher emphasizes. As it implies that I see my interlocutor as having a past development and a possible future one, and not as being here and now and interacting with me. Of course, one could say that this is not a good interpretation of narrative framing, but what interpretation would be an appropriate one? Narratives usually show actions unfolding through time and constituting meaning by expressing the configuration of a character's dispositions and affordances. Shouldn't a narrative framing mean exactly that I see someone as developing new affordances through his actions?

The interactionist might say that "It is not something in the past that causes or determines my action; rather, it is some possibility of the future, some affordance or goal that draws me out of my past and present circumstances and allows me to transcend, and perhaps to change, all such determinations."[43]. Let us analyze the notion of "affordance". According to Gallagher, we perceive others in terms of affordances, that is, as affording the possibility of interacting with us. We also perceive them as fulfilling a certain social role and as such, as having a different set of affordances(waiter, driver, professor, etc.). I take issue with this wholly unrestricted notion. The main problem is rather delicate: while we can intuitively say that we act so as to realize affordances(looking to the future) the jump from this, to perceiving the environment and others in terms of affordances, does not seem valid. First, an issue relating to the qualitative aspect of experience: do you see your lover as a set of possibilities for acting? In some sense it is true that being my significant other means that we can act in ways that I could not with a random stranger on the street. But it seems not only reductionist, but solipsistic to think of someone as a set of affordances. If we were to follow this thesis to its logical conclusion, then every aspect of an interaction is reduced to me, as being able to do this or that (it seems trivial for tools, but does it hold for other people?). In a dynamical system, a part's behaviour is defined by a differential equation that takes other parts of the system as parameters. Every part is defined in relation to the whole and in relation to other parts. I'm not saying that Gallagher would agree that

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[43] Ibid., p. 39.

people's behaviour can be captured in this sort of equation. But this is what the dynamical systems approach ultimately implies. From a first-person perspective, everything I perceive that is given as input of some sort is just a quantitative change in the equation. This parallels Searle's Chinese Room[44]. Given that a person, my friend, and a tree are just quantitative changes, are they meaningful? I think we have solid reasons to think otherwise: my relationship with my lover is not something that can be quantified, and neither are the relations I have with my friends. Gallagher's theoretical framework simply ascribes, metaphorically, a set of affordances to every type of interaction, but this hardly is *the* explanation for the phenomenon in question. And given its many vices, it hardly constitutes an alternative to more plausible theories, such as simulation theory or theory of mind.

Second, an issue seems to prevail. Goldinger et al. argued that language perception is not fundamentally embodied[45]. The problem is based on the fact that the interactionist considers cognition as something action-oriented. Language is set to be analyzed with an understanding based on actions (for example, we understand the meaning of narratives by seeing them as action-oriented; we first grasp the meaning of the actions, and then the meaning of the narrative). If we are to understand statements in a typical conversation as providing new attunements, or new perspectives on a situation, by revealing new or closing old affordances, then it is not clear how are we supposed to grasp the meaning of affordances before grasping the meaning of a sentence: "we cannot conceive of any language comprehension system that would allow a person to appreciate the affordances of a sunset as a precondition to understanding a sentence about that sunset."[46]. The core idea is that "explaining sentence perception without internal representation appears hopeless"[47]. If affordances are to be perceived, without prior interpretation, than it seems like we have reversed the cart and the horse, at least for interactions where the two agents communicate using articulated language (not only through speech acts). We can now see why, even if we were to accept that the dynamical systems approach affords meaning, that there is a fundamental problem with Gallagher's view. Granted, when it comes to more low-level processes, such as dancing tango, the affordance claim seems to not be problematic. And a dynamical description seems like the better explanation of this kind of interaction. Paralleling

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[44] Searle, J. R., *The Rediscovery of the Mind (Representation and Mind)*, MIT Press, 1992, p. 204.

[45] Goldinger, S. D., Papesh, M. H., Barnhart, A. S., Hansen, W. A., & Hout, M. C., "The poverty of embodied cognition.", *Psychonomic Bulletin & Review*, 23(4)/2016, p. 973.

[46] Ibid., p. 973.

[47] Ibid., p. 973.

the attack on the notion of representation in cognitive science[48], we can think of IT as extending, rather than replacing standard approaches to social cognition and, by extension, to the study of interaction. Speaking about "levels" of interaction may suggest some sort of hierarchy, as though talking about what to have for dinner is somehow more elevated than dancing tango. It might be an unfortunate choice of words, but it is nonetheless a heuristical device. We can imagine a line segment of interactions and its extremes as representing highly abstract operations at one end, such as playing chess with someone or talking about philosophical interpretations of interaction, and motor-perceptual processes at the other, such as riding a dual bike or dancing. "Higher-level interactions" refers to those types that fall closer to the first extreme, and "lower-level interactions" refers to those types that fall closer to the latter. Is this a vague distinction? Yes, but it's not meant to be clear-cut. It is just meant to be heuristically useful, and I think it accomplishes its role by resisting attempts to reduce types of interactions either to theoretical inferential or simulationist models or to dynamical ones.

IV. Conclusion

Let us briefly summarize the arguments laid out. I set out to support a pluralistic vision of interaction and social cognition in general: IT is to be viewed as a low-level process that corresponds to concrete know-how situations, such as dancing, whilst the theorist's account of interaction is to be viewed as describing a high-level process, complementary to or interwoven with IT, corresponding to more complex phenomena. In order to properly accomplish this task, I tried to invalidate Gallagher's more radical claims. I first outlined his theory, and then I raised a few problems, beginning by showing that he makes a straw man out of the theorist's view of interaction. Afterward I tried to flush out the inherent tensions between the meaning of our actions and interactions, and the dynamical systems approach, by arguing that the latter, due to its reductionist and metaphorical nature, cannot account for the former. Section III mostly dealt with possible responses to my arguments and, by tackling those, I argued that, even if we were to accept that DSP, NPH, and, overarchingly, the notion of "affordance" can make up for the tensions pointed out, there still remain fundamental problems with the picture of interaction that the interactionist offers. Namely, the jump from realizing affordances by acting to perceiving affordances through an action-oriented perception is not a valid one,

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[48] Markman, A. B., & Dietrich, E., "Extending the classical view of representation.", *Trends in Cognitive Sciences*, 4(12)/2000, p. 475.

and that seeing others in terms of possibilities for acting is reductionist. I also pointed out that, by seeing mental states as being fundamentally interwoven, we provide a model that can elude the interactionist's challenges.

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