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Deflating Autonomy: Human Interactivity in the Emerging Social World

Stephen J. COWLEY[*] & Rasmus GAHRN-ANDERSEN[#]

ABSTRACT. This article critiques recent enactivist attempts to bridge an epistemological divide between the individual and the social *(i.e.* to fill in the posited macro-micro gap). Its central claim is that an inflated view of 'autonomy' leads to error. Scrutinising two contributions, we find that methodological solipsism taints Varela's model: It induces De Jaegher & Di Paolo to ascribe social knowledge to perturbances –contingencies whose logic arises from the closed organization of an individual (De Jaegher & Di Paolo, 2007) and Steiner & Stewart to posit that the predispositions of an organizationally closed world prompt individuals to "receive" shared norms (Steiner & Stewart, 2009). On our deflated view, neither organizational closure nor participatory sense making apply to most human cognition. Rather, we invoke a developmental process based on the recursive self-maintenance that is found in all organism-environment systems (including bacteria). Humans differ in that infants discover ways of making skilled use of phenomenal experience: they learn to predicate something of lived experience. As observers, they connect *impersonal* resources of culture (artifacts, institutions, languages etc.) with on-going social and environmental activity. This human kind of heteronomy links social processes to agent-environment systems that sustain – and are sustained by – historically positioned modes of life. Far from being organisationally closed, human subjects depend on using sensorimotoric prompts to connect the phenomenal with the impersonal and open up a partly shared, partly lived, reality.

Keywords: Enactivism, phenomenology, distributed cognition, human interactivity, radical embodied cognitive science, autonomy, micro-macro gap, functionalism, extended mind.

RÉSUMÉ. Modérer l'autonomie : l'interactivité humaine dans un monde social émergeant. Cet article présente une critique de certaines tentatives énactivistes récentes qui cherchent à surmonter le hiatus épistémologique entre l'individuel et le social (c'est-à-dire à combler l'écart entre le macro- et le micro). La thèse centrale de l'article est qu'une vision démesurément enflé de « l'autonomie » ne peut qu'induire en erreur. L'examen de deux contributions fait apparaître que le modèle de Varela est emprunt de solipsisme méthodologique. Ce modèle conduit De Jaegher & Di Paolo (2007) à attribuer une connaissance sociale à des perturbations – à savoir, des contingences dont la logique émerge de la clôture organisationnelle d'un individu. Par ailleurs, il mène Steiner & Stewart (2009) à affirmer que les prédispositions d'un monde organisationnellement clos incitent les individus à « recevoir » des normes partagées. Selon notre perspective déflationniste, au contraire, ni la clôture

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organisationnelle ni la création de sens participative ne s'appliquent à l'essentiel de la cognition humaine. Au lieu de cela, nous invoquons un processus développemental basé sur l'auto-entretien récursif qui est à l'œuvre dans tous les systèmes organisme/environnement (y compris chez les bactéries). Les humains s'en différencient dans la mesure où les jeunes enfants découvrent des manières d'utiliser avec savoir-faire leur expérience phénoménale : ils apprennent à formuler des prédicats à propos de leur expérience vécue. En tant qu'observateurs, ils connectent les ressources *impersonnelles* de la culture (artefacts, institutions, langues, etc.) à une constante activité sociale et environnementale. Ce type proprement humain d'hétéronomie relie les processus sociaux à des systèmes agent/environnement qui sous-tendent – et sont sous-tendus par – des modes de vie historiquement définis. Loin d'être organisationnellement close, les sujets humains dépendent de l'usage d'incitations sensorimotrices pour relier le phénoménal à l'impersonnel et pour ouvrir sur une réalité partiellement partagée, et partiellement vécue.

Mots-clés : Enactivisme, phénoménologie, cognition distribuée, interactivité humaine, inscription corporelle de l'esprit, science cognitive radicale, autonomie, écart micro-macro, fonctionnalisme, esprit étendu.

INTRODUCTION

The functionalism of classic cognitive science ascribes both individual and social processes to a single intra-cranial ontology. Cognitive systems are said to depend on mental states that are individuated exclusively either on the basis of relations to the organism's other states and/or on the basis of the cognitive predispositions (neural schemes etcetera) of the individual. Leaving aside the non-perturbing environment, such approaches adopt what Fodor calls methodological solipsism (Fodor, 1975). In allowing physical aspects of the world to scaffold the mental states of a predictive brain, cognition becomes a synchronic process. Perception and action are motivated by a system that exploits something like computational real-time to connect physical and neural states. Language and the social order are attributed to individual knowers such that mental states (or content) can sustain language and society. Mental states centre on individual knowers who use the (putative) content to sustain cognition and society (for critique, see Hutto & Myin, 2013). As a result functionalists underplay bodily minutiae, phenomenology or, generally, the experiential 'thickness' of human social life.

While being internalist in classic forms (see Fodor, 1975), much the same applies to recent contributions in cognitive science. (see *e.g.* the extended mind theory of Clark and Chalmers). Where Fodor considers language as grounded in a 'language of thought' Clark argues that automatisms allow the use of 'material symbols'. The same appeal is made to synchronic process: linguistic experience reduces to the production and processing of a synchronic cognitive system that identifies and models utterance-types based on context-free content. While cognitive science is bound to draw on models, there is no need to rely on functional analyses of 'processing'. In adding to the literature striving for more biogenic alternatives, we stress that classic models and the extended mind-theory omit the multiscalar subtleties of how living subjects exploit language and cognition. No room is left for biology, the inter-individual, how interactivity shapes understanding and, above all, how the social world exploits language (Cowley & Vallée-Tourangeau, 2013).

However, other recent contributions seem to offer more suitable alternatives to the methodological solipsism. These are in particular inspired by the bio-cognitive approaches that are increasingly influential in theoretical biology, linguistics, cognitive science and philosophy of mind; and which can be traced to Jean Piaget and Humberto Maturana.[1]

Enactivism exemplifies one such an approach to cognitive science. Extending the work of Francisco Varela and his colleagues, representationalism is to be supplanted by a new view of mind and minded behaviour. For Froese *et al.*, this "begins with an emphasis on biological autonomy and mutually coordinated interaction" (Froese *et al.*, 2011, p. 2). Given such a foundation - and in contrast to ecological and distributed views of language and cognition - enactivism presents itself as a paradigm that can rival functionalism. It models, not mental states, but how living systems self-produce using biological principles that shape interaction. In pursuing interaction-centred cognition, such approaches also contrast with ecological or radical embodied views (Chemero, 2009). However, for some enactivists, theories of embodied cognition need to encompass enactivism. This is suggested in the following quote by Di Paolo & Thompson:

> "[the] key enactive notion of autonomy [...] is needed if embodied cognitive science is to offer a genuine alternative to more traditional functionalist and cognitivist view.". (Di Paolo & Thompson, 2014, p. 68)

In addition, enactivism seems to offer an influential challenge to functionalism as this paradigm shifts emphasis from modelling mental states to pursuing principles that, it is plausibly suggested, may sustain all living systems. This too separates enactivism from more ecological influences on cognitive science.

Hence, enactivism expands the notion of the cognitive beyond the bodily (as in the theories of embodied cognition) by recourse to biological principles. In this sense, biology grounds experience that encompasses an organism's world. While first proposed by Humberto Maturana whose bio-logic treats all living systems as autopoietic, enactivists have turned away from this by adopting Varela's line of thought. Building on observations of the immune system (Vaz & Varela, 1978), a technical sense of *autonomy* is attributed to, not only the CNS, but also experience of an organism's world and, at times, the social domain. In regards to *Homo sapiens*, the direct engagement of lower level organisms is supplemented by the ability to make observations and perform deliberate action. Epistemologically, however, the general theorizing about the conditions of human cognition leads to puzzles about how knowledge is extracted from its historical context. Thus, in some strange way, is taken to be once both individual and social. Enactivism too seeks to explain this as a synchronic process – one arising as interaction co-functions with the body.

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[1] For biology, see Barbieri (2008) and Auletta (2008); for cognitive science, see Chemero (2009), Stewart *et al.* (2010) and Pattee & Raczaszek-Leonardi (2012); for cognitive psychology, see Cowley & Vallée-Tourangeau (2013) and for philosophy of mind, see Hutto & Myin (2013).

In seeking resolve this puzzle, the 'micro-macro' gap has recently been the focus of debate among enactivists. However, as we will show in this paper, enactivism has not yet bridged this gap. As we argue, Varela's notion of (undifferentiated) autonomy makes it difficult for the enactivist to deal with cognitive processes that elude synchronic description.

THE AIM OF THIS ARTICLE

This article engages critically with enactivist accounts of how the individual meshes with the social. It does so by addressing two theoretical contributions which, to our judgement, make the same error. In seeking to bridge the epistemological gap between micro and macro both theories treat autonomy as "the most foundational concept" (Froese *et al.*, 2011). We argue that this strong assumption cannot possibly connect individual and social knowledge. Later, we ask how the micro-macro gap can be rethought as applying to individuals who are born, live and die in history. We do so by sketching out the conditions required for a consistent re-take on the relation between the subject and the social; by avoiding exclusive appeal to synchronic processes, we reconcile the micro with the macro. Above all, we argue that phenomenology needs to be taken into consideration as it serves in making an individual part of a collective social world. Individuals use, not just interaction, but also historically shaped phenomenological experience which grants access to the impersonal resources that are needed to attune to the practices of the social world.

THE IMPORTANCE OF AUTONOMY

Before dealing in depth with the two enactivist accounts, it is necessary to expand briefly on the technical view of autonomy in enactivist theory.

In the outset, the enactivists acknowledge first person experience and, thus, both the world's appearances and everyday epistemology. Leaving bald functionalism behind, lived experience is inserted in a world of social complexity. People draw on practices, identify with roles, and alternate between more individual and more social modes of action. However, like function in classic cognitive science, autonomy is said to be all-encompassing (Froese *et al.*, 2011). In its technical sense, autonomy is alleged to characterize not only the immune system or the CNS but also living organisms – and, for some theorists, even interactions and social structures (Varela *et al.*, 1991). For De Jaegher & Di Paolo, therefore, autonomous systems are "composed of several processes that actively generate and sustain an identity under precarious conditions" (2007: 487). Thus, as with a cell membrane, all such systems maintain an *identity* that serves to delineate kinds of processes. Events outside the system affect its operations to the extent – and only to the – that they are prefigured by a system's *organisational closure*.[2] On this view, autonomy governs an organism's actions but, crucially, not events beyond its membranes. Further, if interaction is treated as autonomous, the system's

[2] Maturana identifies *autopoiesis* as central to biological systems that are said to use *operational closure*. While this is often confused with Varela's stronger notion of *organisational closure* (used to generalise sense-making), this is an act of faith. Mark Bickhard's (2009) view is compatible with the bio-logic of *autopoiesis*.

identity is said to delineate the processes that constitute a world. By using its own history to calibrate interactions, a living being comes to perceive a world. For the anti-representationalist theorist, this allows one to claim, in a metaphor, that perception and action "lay down a path by walking": a living system continuously enacts its world and, using organisational closure, incorporates part of what was once external. Leaving history aside, this two-system view posits organisms-in-interaction that operate in –but as separate from –the environment. Eschewing the neurocentrism of classic cognitive science, emphasis falls on the dynamics of multi-layered autonomous systems. In cells, the CNS, organisms or interactions, appeal to bidirectional coupling thus replaces input-output. This theorisation of autonomy unites the enactivist approaches to the micro-macro gap. In both cases, an interactional sub-system is said to prompt an organism to enact a world that, over time, enables it to incorporate knowledge of the social. If functionalism is organism-centred, this view ascribes a new 'core role' to the putatively synchronic events that constitute situated interaction.

In this article we consider two theories that adopt versions of this view. First, we discuss an influential paper by De Jaegher & Di Paolo that seeks to fill the gap 'inside-out' (De Jaegher & Di Paolo, 2007). The social is to be explained by how living systems use interactional contingencies in real time 'participatory sense-making'. On *a priori* (or theoretical) grounds, interaction is said to be grounded in autonomy *qua* organisational closure. Then, asking how the social enters individual sense-making, this is traced to participation dynamics.[3] On this view interaction too becomes autonomous (in the sense of organisationally closed). Finding exclusion of the non-local and historical far too narrow, we then turn to Steiner & Stewart's counter proposal (Steiner & Stewart, 2009). Working outside-in, the authors place interaction in a social world of norms where human autonomy co-functions with social norms (or what they term *heteronomy*). Given a suspicion of residual solipsism, Steiner & Stewart stress that human autonomy is bound to co-function with heteronomy. On this view, emphasis shifts from interaction to the claim that norms, not history, transform the individual's organisationally closed repertoire. Thus, while extended beyond an individual's bounds, even appeal to heteronomy centres on a knower/doer's autonomy and, thus, leaves aside non-synchronic aspects of cognition.[4]

Both sets of authors accept Varela's notion of the organisational closure of autonomous systems. While disputing whether the social reduces to contingent sense-making or whether it is inherently normative, both place autonomous

[3] In Froese *et al.* (2011), the authors meet some of the criticisms that are made below. First, conceding that participatory sense-making is too inclusive, they distinguish 'aggregations of single-cell organisms' from 'inter-individual interactions between humans'. They also offer a more elaborate view of how people depend on 'enaction of social quality in relation to others', an aspect of interaction said to use 'at least some form of incorporation of heteronomy.' However, in spite of this concession to Steiner & Stewart, they neither acknowledge the narrowness of their view nor reconsider its foundations. Given our interest in the latter, we have chosen to focus on how the debate was originally motivated.

[4] An anonymous referee thinks that enactivism escapes from methodological solipsism because it does not focus on events within the boundaries of an individual: we disagree; we take it to be caught by the same problem because autonomous systems are treated as internally defined ('closed').

living systems alongside the workings of interaction. Their emphasis differs: whereas Di Jaegher & Di Paolo also ascribe autonomy to an interactional sub-system, Steiner & Stewart emphasise an autonomous individual who uses interaction to attune to social norms. Thus, while reaching beyond the brain and the individual body, both ascribe knowing to the autonomous individual's organisational closure. In so doing, we argue that both views reintroduce methodological solipsism. While not reifying events between input and output, they nonetheless limit the scope to cognitive processes to those that are enacted by a living system-in-interaction. In making what lies beyond this synchronic time-scale irrelevant to their theories, they lose sight of non-normative aspects of both particularities (*e.g.* the use of prosody, gesture and facial expression) and sociocultural constraints (*e.g.* cultural propensities, traditions and language-specific features). By contrast, in emphasising the non-synchronic, we deflate autonomy by allowing human action-perception to be changed by the phenomenal and, above all, the thickness of lived experience.

AUTONOMOUS SYSTEMS IN INTERACTION

De Jaegher & Di Paolo propose a model of how organisms exploit social interaction (De Jaegher & Di Paolo, 2007). Rejecting representationalism, they claim that, in humans at least, biological 'sense-making' is supplemented by *participatory sense-making*. Given their biological nature, the sense-making of human beings is claimed to bring forth modes of interaction that feature autonomy. This is said to seed a social domain which, as described below, is often characterized by what happens when two people meet in a corridor as they basically synchronise their movements and, in so doing, find themselves momentarily pulled from their individual worlds.

Varela's view of autonomy allows sense-making to arise as organisms interact with environments while using self-organisation to sustain 'identity'. Where a system self-sustains, it can be selective in acting towards the world or, in Thompson's terms, it "casts a web of significance" that sustains identity while regulating organism-environment exchange (Thompson, 2007). For the sake of argument, we allow that 'sense-making' can be applied to simple systems; our concern is merely to deny that its participatory counterpart can throw light on human modes of life.[5] In the first place, a concept that applies to action-perception of beetles, flat-worms and bacteria seems unlikely to be the main underpinning of society, culture and human cognition. Second, because sense-making is ascribed to all living systems, its power lies in characterizing shared or simplex tricks of nature. Thus, sense-making may be crucial to maintaining a bacterium's identity and, in a beetle, the CNS may regulate both adaptation and the use of available resources. However, even the niche

[5] We prefer Chemero's (2009) thesis that all cognitive activity derives from agent-environment dynamics. On this ecological and distributed view, any viable model will allow living systems to link bidirectional organism-environment coupling with ways of distinguishing self from other while also changing the affordances of the world. While the view can be traced to Peirce and Dewey, it was taken up in ecological psychology, rethought by Maturana and developed by both Timo Järvilehto's organism-environment approach and various bio-semiotic views (including code-biology). The emphasis on sense-making is, however, unique to enactivism (competing theories appeal to languaging, (bio)semiosis, interactivity, affordances, results and processes of organic coding).

construction of, say, earthworms, is irreducible to sense-making. It also depends on non-perceived aspects of the material environment. In human niche-construction, we argue, the material is supplemented by the historical. Complex cultural products and procedures link environmental structure to complex modes of social interaction (*i.e.* using artefacts, institutions and languages) that grant us a species-specific extended ecology (Steffensen & Fill, 2014). The impact of cultural life cannot be understood synchronically or, in short, by appeal to sense-making. No ahistorical principle can capture, on the one hand, the historically-embedded powers of humans and, on the other, the synchronous 'sense-making' of most living beings.

Sense-making allows organisms to re-enact self-organised order by dealing with 'perturbances'. A long history of so doing gives an organism viability that depends on using a very few degrees of freedom. Self-regulation and self-maintenance are thus attributed to the organism's closed organisation. The focus on perturbances allows the hypothesis that, like an immune system, organisms attune to variations from the 'outside'. Whereas a functionalist would tell an adaptionist story, the enactivist claims that the system's closed organisation comes to serve as its own self-producing core. While the theory is based in systems that lack direct contact with the outer *(i.e.* the immune system and the CNS), the principle is further generalised by redescribing instances of human activity as 'participatory sense-making'. In several settings, Di Paolo illustrates with reference to the important work on 'perceptual crossing'. In an experimental set-up, blindfolded participants used a computer while two-way interaction was restricted to a kinetic sense. Using a special program, participants are able to distinguish between identical stimuli by using real-time dynamics (also called 'sense-making') (Auvray *et al.*, 2009). Crucially, participants identified each other's stimulus-objects through its response to dynamics. This was established by checking a correlation between participant button-pushes and actual encounters with the avatar of a living being. In discriminating, participants can only depend on inter-individual dynamics that draw on social contingencies: the experiment is offered as a paradigm of participatory sense-making. This is defined as sense-making that occurs between two (or more) human individuals whose embodied activity can now be legitimately deemed social. Not only does activity of this kind plainly occur but, crucially, the experiment shows that embodied social contingencies can transform interaction. The process, however, is ahistorical: it occurs in a closed experimental world where, even post hoc, most parties are unable to report how they accomplish the task. While showing that interindividual dynamics can enslave human-organism dynamics, this does not show that the 'process' under description uses principles that generalise to all human forms of social life.

De Jaegher & Di Paolo play down the poverty of Auvray *et al.*'s experimental world. Leaving aside how blindfolded participants use a single stimulus-type to seek out dynamics by means of a simple choice, they focus on an interaction-centred individual. The same narrowness characterises their favoured examples of participatory sense-making. A classic example is gaze-following. If an individual learns to track the gaze of others, as infants undoubtedly do, a simplex trick *can* bring about rewards. For De Jaegher & Di

Paolo, this is to be explained by appeal to autonomy: in-built values gives rise to participatory sense-making that leads to unexpected outcomes. Importantly, this is more than a concerting of attention. Indeed, for De Jaegher & Di Paolo, coordination generates contingent patterns whose basis arises in the (autonomy of) the interaction itself. As in perceptual crossing, participants are manifestly more likely to respond to interactional promptings-that-prompt. While not based on awareness, analysis shows clear differences in response to identical stimuli that are associated with living and non-living systems. However, gaze following too is ahistorical. A third often cited example is illustrated with reference to the vignette of a corridor dance. Participatory sense-making is said to occur when people meet in a corridor and, inadvertently, synchronise movements such that each momentarily blocks the other's progress. In De Jaegher & Di Paolo's terms, perturbances (or contingencies) lead each autonomous system to reconfigure. In this case, moreover, each individual can offer first person reports of the perturbance and, crucially, the outcomes plainly derive from interactional contingency. For De Jaegher & Di Paolo, since the corridor dance is not based on individual intentions in the outset, it is warranted to ascribe autonomy (organisational closure) to the interaction. An interplay of dynamics shapes joint performance that has interpersonal consequences; by hypothesis, this model captures the genesis of the 'social'. By attributing autonomy to the interaction, the people attain access to structures that are manifest as perturbances in an inter-person zone. For De Jaegher & Di Paolo, the interaction mimics a living system: its dynamics prompt parties to experience something that otherwise would not have arisen. Scaled up, this is alleged to ground how people come to know about one another and the social world: it is nature's way of bridging the micro-macro gap. While having contemporary relevance in that urban life makes much of encounters with strangers, the ahistorical example also contrasts strikingly with perceptual crossing. Whilst the experiment reveals a statistically based ability to discriminate, a corridor dance gives rise to thick experiences.

The example is thus amenable to modes of description that avoid Varela's vision of autonomy. In Maturanian terms, each person acts as the 'medium' for the other – in this sense, the meaning making is direct. On this view, the case is amenable to more ecological modes of description–bidirectional dynamics (that need not be autonomous) connect fully-fledged human observers (who are organisationally open). In the coridoor dance, participants draw on contingent affordances. Indeed, this may be why, as observers, they can construe events; not only are these experienced but, crucially, they can be described in relation to "what happens". By appealing to Varelian autonomy, this insightful aspect of Maturana's work is entirely lost. In the corridor, but not in the lab, participants can predicate something of experience: "everything said, is said by an observer." In other terms, the parties rely on, not just dynamics, but using phenomenal experience to relate to their own relating. This capacity is irreducible to participatory sense making: in deflationary terms, it can be said to exemplify 'recursive self-maintenance' (Bickhard, 2009). Indeed, we think that it is for this reason that the corridor dance has proved to be such an arresting example of how humans exploit sense saturated coordination. It is one that we can relate to as human observers, as people who may have found ourselves – or wished ourselves – in just such a situation.

It is precisely this which is our problem. By ascribing organizational closure (or autonomy) to the events, Di Jaegher & Di Paolo overlook the phenomenal. They leave aside Maturana's important work on how human organisms become observers (see, Raimondi, 2014). Instead, by invoking high level biophilosophical principles (*e.g.* participatory sense-making), they mask the peculiarities of human ontogenesis and personhood (*i.e.* the individual as a social being). Above all, by invoking autonomy, they play down the phenomenal. Rather than pursuing its complexity, the 'social' is treated as independent of what can be said (*viz.* as reducible to general principles). Further, by implication, perceptual crossing, the corridor dance and all other modes of human interaction draw on the same principle of autonomy. Indeed, De Jaegher & Di Paolo take pains to argue that this is necessary to participatory sense-making; as they write:

> "[...] if the autonomy of one of the interactors were destroyed, the process would reduce to the cognitive engagement of the remaining agent with his non-social world. The 'other' would simply become a tool, an object..." (De Jaegher & Di Paolo, 2007, p. 492)

Living systems undoubtedly depend on self-maintenance. We fully concur with this important biological principle. However, in Maturana's terms, this depends on autopoiesis -it does not presuppose organisational closure. Indeed, in humans, the status of observers can be traced to the recursive nature of multiscalar events. This, however, is irreducible to autonomy in it technical sense.[6] For example, the environment's perturbations determine neither how organisms use a niche nor how living agent-environment dynamics contribute to taking on a position in a historical world. As a result, human experience has a phenomenal thickness; conversely, where these riches are lacking, events like a corridor dance are unlikely to occur. Far from depending on organisational closure, people actively choose and/or inhibit action.

Participatory sense-making conspicuously leaves the phenomenological out of account when it comes to explaining the social. This is because, rather than begin with the richness of experience, De Jaegher & Di Paolo base their model on previously elaborated principles. Leaving aside the complexity of social behaviour in, for example, bacteria, bees, meerkats and baboons, they contrast human sense-makers with other living systems. It appears that humans, and humans alone, use participatory sense-making. In so doing, they play down the fact that we can say things about it and report in terms that others can (partly) understand. In making this critique, our concern is theoretical: by deflating autonomy, we emphasise the richness of human experience.[7] Emphatically, our claim is not that De Jaegher & Di Paolo fail to grasp that humans are living subjects (or observers); rather, we challenge how they conceive the consequences of (social) subjectivity. They say, for example; "the interactors are

[6] The issue does not concern what is ordinarily called a person's autonomy: thus, if the participant were an android or a horse, there would still be organizational closure. By contrast, our intuition is that, in a corridor dance, *personhood* is crucial.

[7] Bickhard's (2009) 'recursive self-maintenance' makes no claim to explain phenomenal experience; in deflating autonomy however, it is sufficient to establish continuity between humans and other living systems.

highly plastic systems that are susceptible to being affected by the history of coordination" (*ibid.*). In our view, this is a feeble claim.

The corridor dance evokes a social world based on experience of iterated contingencies. Like the functionalists, De Jaegher & Di Paolo play down subjectivity and fail to see that action, thought and emotion draw on, and are constituted by, experience within a normative order. In participatory sense-making, what lies beyond the body can only exist through an organisationally closed agent's response to (autonomous) interactional perturbances: in a real corridor dance, however, lived events take on local sense –we guess at what people mean/want and what could happen. Thus, social norms imbue lived experience with a particular sense. Thus, in human life, a momentary encounter can spark, for example, fantasy, embarrassment or desire. In a world of participatory sense-making, only perturbances shape the world beyond embodied interaction. In showing that biology uses the interpersonal domain to influence the sensorimotor and feeling, De Jaegher & Di Paolo offer important insights. However, they neither clarify the social nor how humans exploit the world the head is in. From this perspective, constitutive experiences are placed within a theoretical black box. Embodied decision-making reduces to the synchronic products of contingent interactional dynamics. Participatory sense-making denies any subjective control to experience and, by so doing, precludes interpretation based in phenomenology. It is blind to the multi-scalar nature of beings that live in a cultural world. In relation to the social domain of human living, participatory sense-making represents a small step beyond functionalism.[8]

HETERONOMY AS A SUPPLEMENT

Steiner & Stewart offer another enactivist view of human social life. By allowing values to exploit pre-established norms, much of what people do, think and feel becomes socially derived. This opens up the non-local or, in other terms, a wider world than that of participatory sense-making (Steiner & Stewart, 2009). While Steiner & Stewart also invoke organizationally closed human agents, these are now allowed to draw on their own histories. This is because, far from relying entirely on contingencies, people are regarded as heteronomous. Aware that ascribing this property to autonomous agents may seem contradictory, heteronomy is defined with care:

> "[…] a state or attitude proper to an organism, a person or a group and designates the relations between individuals and social norms, comprised of a normative order, which is shared amongst the individuals within a particular social setting". *(ibid.*, p. 531)

Not only is the order shared, but it also "consists in receiving the principles that govern the action of the system from external resources, whose existence and content are largely independent of the system in question" (*ibid.*, p. 529).

[8] As noted, Froese & Di Paolo (2011) modify this blanket view of participatory sense-making. Interestingly, they link the focus on autonomy to Froese's work in robotics –a field where interaction is the only basis for distinguishing 'self' from 'other'. However our point is that we find no evidence that an interaction-based view of agency is sufficient to clarify either language or human living.

Thus, while autonomy allows each individual to develop her own values, appeal to social norms also prompts use of 'shared relations' to 'receive the principles' that govern a social or normative order. Conceived thus, heteronomy grants an impersonal domain while, at once, allowing each individual a (presumably) Varelian kind of autonomy. For Steiner & Stewart, this offers a way of "extending biologically grounded cognitive autonomy" while "avoiding solipsism" (*ibid.*, p. 532).

As "constituent elements of social systems" people draw deeply on social phenomena (*i.e.* social norms) to bring forth a world. Since they receive community norms, autonomy expands experience as the individual draws on knowledge for which he or she is already predisposed. Although independent of lived experience, heteronomy limits how a living being grasps the world. Importantly, this grants understanding to the impersonal aspect that is repressed in participatory sense-making. In invoking social norms, the micro-macro divide is bridged outside-in. As enactors of the social world, people also receive a social bounty. Accepting the duality, norm-based actions become a person's "most basic form of "sense-making". Right from the start, human life is thoroughly social, because "actions are themselves entirely social" (*ibid.*, p. 542). Far from depending entirely on perturbances, the heteronomy of social life exploits interactional resources whose normative relations lie beyond the individual's world. As a result an individual can become attuned to an impersonal domain that is based on a history of shared relations.

The view has considerable merit. Rather than relying on interaction-based contingency, people follow rules, obey laws and construe grammatical utterances. But does this save the autonomous system from the methodological solipsism associated with organisational closure? Steiner & Stewart's answer is that, given heteronomy (as part of our organisation and/or derived structure), people access a domain of 'norms' that, they claim, regulates interaction. Thus, just as an organism links an autonomous core with a received periphery, so it is for the environment too. The closed domain of bodily organization is thus balanced by the historically derived invariants of a society. It is as if human life depends on a historically located Universal Other that prompts conformity with local ways of acting to bring forth a person's world. Organism-environment coupling is thus doubly organisationally closed: interaction-centred activity (or sense-making) is supplemented by the use of norms that are attuned to shared relations. In short, organism-environment interactions are reshaped as the organism tunes in to the normative. As people connect activity and contingencies, norms play people as if they were pianos with an invisible player.[9] Human lives are thus dominated by an overriding socio-logic that harmonises human action (and speech) with more autonomous modes of being. Further, in that each agent is operationally closed, people rely on predispositions used for 'receiving' impersonal experience. Indeed, in metaphorically laying down a path through walking (in an envelope of

[9] An anonymous reviewer suggests that, if heteronomy is part of autonomy, then that puts social norms in the organisationally closed system. Our objection is not to the view that people *orient* to social norms; it is to the view that norms dictate the behavior of organisationally closed systems –hence the musical metaphor.

viability), the agent implicitly fits personal knowledge to its impersonal –and normative –framing.

METHODOLOGICAL SOLIPSISM: RETHINKING THE ISSUES

In order to avoid methodological solipsism, enactivists trace the known to a world beyond the brain. Refusing neurocentrism, De Jaegher & Di Paolo treat social contingencies as extending the scope of individual experience. We have argued, however, that this view is too weak and, worse still, it treats human life as like that of other species in being fundamentally synchronous. To clarify the social and the complexity of social phenomena, moreover, one needs more than evidence of (unconscious) interpersonal contact like that of perceptual crossing. While the in-between zone is crucial to human life, like Goffman's (1983) interaction order, it identifies one aspect of human contact. We find no support at all for the view that scaled-up, sense-making can clarify how people construct 'shared 'reality'. We conclude that concepts such as autonomy, sense-making and perturbance are quite inadequate for understanding human social life. Indeed, the De Jaegher & Di Paolo zone in-between recalls a no man's land between two black boxes. While throwing light on coordinated movement, even a corridor dance lacks the richness of concerted human activity. The black boxedness of the individual ensures that, from the outset, the links between intentional states and the "zone" are entirely speculative. We find no evidence that participatory sense-making clarifies the emergence of a social domain. Rather, participatory sense-making allows coordination to link sensorimotor activity with interindividual contingencies. By placing values inside individuals, appeal to sense-making masks the complexity of both observation and concerted action. While enactivists avoid ascribing 'cognition' to an input-output system, appeal to organisational closure carries a residue of methodological solipsism. This is because in contrasting events in the world with how 'systems' enact behaviour, the motor of cognition is ascribed to, not agent-environment interactions, but autonomous entities.

Steiner & Stewart place heteronomy at the heart of social life. While assuming autonomy, they seek to avoid solipsism by ascribing human-human-object relations to social life. *Contra* De Jaegher & Di Paolo, interaction allows parties to 'receive' norms and align to a social world. Importantly, historical collectives can, on average, to affect human thinking. However, methodological solipsism has residual effects. While allowing both individual and social knowledge, Steiner & Stewart merely assume that they are commensurable: they can offer no view of how people receive norms or adopt shared relations. By treating the micro and macro as distinct, the normative becomes a social mirror of a functionalist's 'mental states'. Like De Jaegher & Di Paolo's sense-maker, their social individual lacks phenomenological subjectivity and, for this reason, they overlook the particularities of interaction to focus on conventional use of language, social institutions, tools and practices. Whereas Fodor ascribes everything to the organism's states, Steiner & Stewart grant a similar role to a social history. They cannot show how the micro and the macro combine because they separate the living system from the impersonal (or: other). While perhaps applicable to how an immune system deals with potential threats, this 'inner' domain lacks intentional contact with

the chaotic outer world. Not only is the immune system anything but social but, we argue, it lacks any experience that resembles the thickness of human living. Conversely, in highlighting phenomenology, we escape from the need to posit that individuals manage social encounters through latent predispositions.

Further, since Steiner & Stewart reduce the social to the pre-dispositioned, they claim that

> "[it] is because a certain behaviour is produced in accordance with norms that it constitutes an action". (Steiner & Stewart, 2009, p. 529)

They miss the richness of phenomenology by making repetition (or re-actualizing, as Steiner & Stewart call it) into repetition of *the same*. In nature, however, there is only ever "repetition" of *the similar* (cf. Deleuze, 2010). Further, its basis has been attributed to how movement draws on sensorimotor synergy (Bernstein, 1967). Indeed, without a synergetic basis, it is hard to see how language and the social world would be able to take on their rich subtlety and nuance: people would have to be either keyed by norms or deficient in so doing. Even if an observer were able to treat interactional patterns as identical, this would fail to make each experience unique. And, of course, the meaningfulness of experience is what determines the relevance of specific norms and rules. This cannot be explained by rules and norms in themselves because, simply, they are part of individual experience.

We concur in tracing radical cognitive science to how self-sustaining, self-discriminating living (*i.e.* biological) systems co-evolve. However, we challenge emphasis on organisational closure or, in short, Varela's concept of autonomy. Although sense-making may contribute to interaction, used as a basis for individual knowing, it fails to expunge solipsism. Above all, it precludes direct use of thick experience. Even if a conception of organisational closure characterises some life-forms (*e.g.* immune systems), the view cannot be generalised to all living systems. In humans, wolves and cow-birds, at least, more is involved. Far from merely attuning to a social world, individuals transform perception-action as they draw on direct experience. Humans become living subjects who have radically transformed the ecology.

THE SUBJECTIVE, THE SOCIAL AND THE IMPERSONAL

In deflating the role of operational closure in human social life, we have been negative. In this final section, we begin to sketch a positive response to one crucial question: How is can one achieve a consistent basis for understanding the relation between the individual and the social? Our claim is that, rather than ascribe Varelian autonomy to systems, it is enough to allow that living beings self-maintain by drawing on the environment's resources. In complex social mammals, such as ourselves, this has become inseparable from language-behaviour and, as a result, historically derived resources transform each person's phenomenal experience. Human cognition is diachronic; thus, as Maturana saw, people come to live as observers. In deflating autonomy, we place special weight on how human living uses the impersonal and, such that history enables biological observers to construct (social) subjectivity.

Elsewhere (Gahrn-Andersen & Cowley, forthcoming), we elaborate our argument in more detail.

The assumption of unconditioned (and hence, undifferentiated) autonomy can be replaced by allowing recursive self-maintenance to reshape the phenomenal experience of agent-environment systems. This, we hypothesise, permits an epistemological connection between the individual and the social. While not explaining the phenomenological, this deflated version of autonomy (viz. recursive self-maintenance) suffices to link human experience with that of other species. What is typically human is, thus, how a historical residue becomes part of individual modes of talk and action. In that sense, Steiner & Stewart are quite correct that the social is heteronomous and impersonal. However, for the same reason, impersonal aspects of the social need to be viewed as enabling an agent to use recursive experience (Maturana's languaging) as the self-maintaining biological individual self-differentiates from the socially individual *(i.e.* impersonal). Hence, the impersonal of the social is bound to depend on a self-maintaining sensorimotor system and an individual actor's intentionality– on human interactivity. In short, the social depends on connecting the biological with the phenomenological. The human being is still one and the same being, yet she exists on different ontological levels.

In addition, interactivity can be traced to how the social emerges from the phenomenological, while also being able to condition it henceforth (see also, Neumann & Cowley, 2013). Indeed, this must be done in order to avoid a dualism and hence, the residual solipsism associated with organisational closure. It is possible to avoid both of these by showing how personhood is constituted by linking the sensorimotoric to the feelings of the biological individual. Hereby, human phenomenology, not identity, comes to be seen as necessary to the social. Further, by the same token, one can avoid functionalism and determinism.

Social interaction is not fulfilling functions which it is destined for in advance. At the outset, the social lacks a *telos*. Hence latent predispositions in the individual cannot account for the social. Rather, diachronic sensitivity can be developed by linking recursion to the sensorimotor and using the consequences to self-configure as an observer. Once people are able to perceive social processes in terms of goals and purposes, they can unreflectively treat the social as an ecologically sensitive repetition of the same (*i.e.* identical processes that contribute to the realisation of a specific goal or function). But, as Deleuze argues, repetition is repetition of the similar – never of the same (Deleuze, 2010). Repetition of the similar is, we think, sufficient to ground a viable approach to how the impersonal permeates human living (*i.e.* the norm-based interaction of individuals). Based on the repetition of the similar, one can formulate a consistent account on how the impersonal (*i.e.* norm-based interaction of individuals) epistemologically affects each person partaking in the interaction while the social emerges out of this particular interaction. Such an account on the emergence of the social cannot be derived from sense-making; it is necessarily diachronic. For an observer, its beginning must lie in interactivity or a living system's ability to use nexus of the sensorimotor, the biological and the phenomenological.

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