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Sense-making with Ezequiel Di Paolo^{1,2*} and Hanne De Jaegher² Interview

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A highly philosophical question: what do you think - is society a higher, better organized ‘tissue’ of life than a single human being?

Ezequiel: What exactly is a *single* human being? Does not the idea of a person already imply belonging to a social “tissue”? We live under the contemporary mass illusion that individual people are finished wholes to themselves, that we are islands and that at most we build bridges with a few others – family, friends, colleagues – while we forget that the patterns of our thinking, our style of walking, of breathing, our physiology, our motivations, our speech and gestures are all braided from the readily available threads of our socio-cultural embedding. Understanding this mass illusion has consequences of the utmost urgency today. Not only do we miss a crucially central level of enquiry if we focus solely on the individual agent in neuroscience, psychology, psychiatry and philosophy of mind, not only do we prevent ourselves from asking the right questions about what makes a cognitive agent an individual in the first place if we miss the socio-cultural embedding as a source of active, systematic mind-shaping, but we also fail to understand values of community, solidarity, trust, networking and we fail to give our lifework to a project larger than our individual selves. These values are not the remote ideals accessible only to selfless fictional heroes; they are in the very fabric of the processes that make human beings what they are; they are at the root of us all. At some point, for diverse reasons, we have been drilled into forgetting these origins to better fit a model of selfish freedom without commitment to others, which is manifested largely in the apathetic behaviour of the perfect consumer that only wants from society the goods it has been told to crave.

This is the context that as researchers we are often disciplined to ignore. Cultural isolation operates strongly by reinforcing the separation of key conceptual elements and by stifling the development of modes of thought that we so badly require (e.g. social scientists see neuroscientists as naïve reductionists and neuroscientists see social science as so much babbling and empirically void).

Sometimes the ontological implication (our minds are social in essence) is not denied, and adopting an individualist attitude is defended as a reasonable methodology: “We must start somewhere in our enquiries and we choose the individual as a locus of explanation until we exhaust this possibility and then we shall, in the future, consider a more complex dimension involving social interaction and other socio-cultural processes”. Our work on *Participatory Sense-Making* and the *Interactive Brain Hypothesis* shows that such an attitude is methodologically misconceived. It often leads to easily dissolvable problems once they are recast in their proper social dimensions. Unnecessary effort is invested in non-issues (e.g., “How do I manage to simultaneously hold two potentially conflicting representations, my belief and yours, in my head?”). And holding fast to methodological individualism soon leads to “epi-cyclical” theorizing, abandoning Occam’s razor and scientific common sense. As we are showing in our work, the dynamics of social interactions often provide much simpler and straightforward explanations of some socio-cognitive performance if we let go of the archaic idea that everything that happens in my cognitive world must always happen first in my head.



picture source: H. De Jaegher's archives

Coming back to the ontological aspects of your question, there is indeed something unresolved in the relative autonomies of the domains of the individual mind and socio-cultural processes and their contradictions. We do believe that neither domain is fully reducible to the other. But we also believe that this does not imply their full independence, as we have shown pragmatically, but their complex inter-penetration. What does this tell us about the nature of concepts such as individuality, interaction, society, normativity, etc.? At least this: that we are dealing with phenomena that admit multiple forms of enquiry, none of which is explanatorily sufficient on its own. Those who really want to understand these phenomena must get used to thinking with the tools of more than one discipline and in collaboration. There's no other way.

Hanne: I agree. I think that both society and human beings (and other animals or living beings) are organized at the level that is appropriate for them and for the environment they are situated in. The organization of societies and of living beings develops in conjunction.

There often arises a dilemma in social cognition concerning which came first: an individual or a group. What is your view on this issue?

H: I think the "which came first" question is misleading. We tend to think that things are linear, but, even though it's difficult, it may be more interesting to understand them in a circular fashion. The notion of an individual does not make sense without that of a group, and vice versa. Why is the question of which came first so compelling (and is it really)? What do we expect from an answer to this question? I'd be more interested to think about the links between an individual and a group, and I don't just mean the positive links, also the negative ones, the tensions. If you think in linear terms about these matters, it's hard to see the dynamics that give rise to growth, to development, to change.

E: This is an age-old dilemma. I also don't think it should be put in terms of what came first, but in terms of what is the right level of analysis given a particular set of assumptions and a particular problem (a lot of trouble is created simply by trying to answer such questions with absolute generality, but in each particular case there are often clear indicators of what counts as important and shouldn't be assumed away). Even in such terms the question remains paradoxical because we know that society, the group, is the braided pattern and material traces of the activity of individuals, and at the same time, human individual autonomy is the outcome of a social process of struggle for mutual recognition. So where to start? This is a problem only for the 19th century model of scientific thinking that attempts to explain everything linearly, billiard-ball style. I concur with Hanne on this point. Non-linear, dynamical ideas are the only vehicle for any real advance in the sciences of the mind, which are regrettably still dominated by linear thinking. From this perspective the back and forth epistemological shifts between parts and whole become the common currency of enactive thinking. We see this in the example of life, in our attempts to understand the dialectics between genetic regulatory networks and cellular dynamics, between individual cells and the extra-cellular matrix, between single neurons and synchronized ensembles, between

nervous system and sensorimotor coupling, and between individual affects, actions, perceptions and intentions, and social interaction. The same pattern repeats itself. We are always invited to bring two apparently incompatible perspectives into a mutual dialogue, which is never simply a dialogue about what comes first, what causes what. We want to understand the various relations of mutual constraining and relative independence of the domains we study. This is what we mean when we say that enactivism has a *parallax epistemology*, we constantly shift our vantage point and gain knowledge from the movement. But this is simply another way of saying that enactivism is inherently dialectical.



picture source: E. Di Paolo's archives

What problems do you encounter in understanding social enactivism?

Both: In general, we have found that the approach is enthusiastically received. Of course, this doesn't mean that people readily agree with the enactive take on social understanding. There are genuine unresolved questions and challenges within the approach and ongoing debates with more traditional perspectives. Sometimes, though, problems also arise out of misunderstandings. Enactive ideas are based on a specific technical vocabulary (autonomy, sense-making, and so on) and these terms are not at first easily differentiated from more common uses in philosophy and cognitive science, or indeed in everyday language. This can be a source of initial misunderstanding but it is solvable with ongoing dialogue. Because we offer a perspective that contrasts sharply with the representationalist approach (theory of mind, simulation theory, etc.), sometimes our message is interpreted in a more extreme sense than we intend (for instance, when we are called 'interactionists'). This leads to misconceptions like

that we don't take seriously the individual or sub-personal levels that affect social understanding, or that we care only about basic forms of interactive phenomena like body synchronization, but not about the so-called higher level social understanding (such as thinking about the reasons for someone's actions). This is definitely not the case.

Another possible source of misinterpretation is that we focus on a broader conception of social understanding than just mental events about other people. We include in our conception phenomena such as trust, coordinated action, negotiations, conflict, relationships, love, domination, mutual recognition, social roles, social norms, and so on. Our approach is more generally concerned with *intersubjectivity*, by which we mean the meaningful engagement between subjects. These three terms: meaning, engagement, and subject are grounded in enactive theory rather than assumed as unproblematically given. Social understanding in this sense includes social action, skilful social engagements, interaction practices as well as – sometimes – thinking about the intentions of others.

Assuming that explaining this gamut of phenomena is somehow dependent on first explaining how we figure out the intentions of others is a widespread intuition. We question this intuition.

'Neurophenomenology: a Methodological Remedy for the Hard Problem' by Varela was a kind of a manifesto of the emerging neurophenomenology. 'A sensorimotor account of vision and visual consciousness' by O'Regan and Noë was an analogical text for the sensorimotor approach. Can your work 'Participatory Sense-making. An enactive approach to social cognition' be treated in a similar manner?

H: Phew, this I find very difficult to answer. History will tell, won't it? I at least see that paper as a basic one in my own work, I think we laid down some basics, which at the same time already seem to contain many seeds of what has already come and is still to come after. People also seem to have found it interesting and inspirational so far, so who knows? I'm in any case curious to see what will happen further with the ideas.

E: This is a generous comparison and of course it is not up to us to respond to this question. We are happy that our text managed to articulate a tension that was "in the air" in many domains. Many of the ideas and motivations of this text are hardly new. What's novel is the bringing together of some elements of enactive theory (autonomy, sense-making) to specifically clarify intuitive notions such as that of a social interaction (surprisingly, previous to our work we have found no clear, non-circular scientific definition of the term) or what it means to participate in each other's sense-making. The resonances we have encountered in various disciplines (psychiatry, psychopathology, different forms of movement therapy, conversation analysis, dialogical self theories, infant intersubjectivity, musical studies, ethics, interaction studies, robotics, etc.) speak as much of the *Zeitgeist* as of the text itself.

'Participatory sense-making ...' was supposed to be the first attempt at an enactivist account of social cognition. Is this work sufficiently grounded in research?

Both: Our work is primarily conceptual. It follows Deleuze's description of the work of the philosopher as an "inventor" of concepts. Concepts are tools. The test of the tool is whether it is useful. Participatory sense-making, as we said, has already been taken up as a concept and applied to the formulation of enactive hypotheses in developmental psychology, neuroscience, human-robot interactions, animal ethology, evolutionary robotics, ethics, psychiatry, literature studies, and other fields. People have used it to discuss and further embodied accounts of individual and political affect and part of our current work is looking at the relations of individual and social institutions using this concept. In our view, this is a good test of whether the concept is grounded in research: not merely whether its origins are solid, but whether it is useful.

As to the research strands that ground this concept, they're too numerous to mention: the enactive concepts of autonomy and sense-making, the dynamical systems concept of coordination, developmental evidence of various forms of co-regulation of movement and affect, phenomenological grounding of the experience of engaging in interaction, experimental and modeling evidence such as the double TV-monitor and perceptual crossing studies, evidence from gesture and conversation analysis, and from autism research. Not to mention a tradition of non-individualist thinking going back to Hegel, Dewey, Mead, Cooley, Vygotsky, Elias, Goffman, Mauss, Merleau-Ponty and Bourdieu.

Have you identified any issues in cognitive science that cannot be explained outside the concept of participatory sense-making?

Both: This is a bit of an odd question. We do not try to explain everything, just those things that involve a social element and these are likely to imply some element of participatory sense-making, either contemporaneously or developmentally. Having said that, we think human minds, human personhood and human autonomy are largely social, so PSM will probably have something to say about many aspects of the human mind, even some that do not immediately seem social, like the perception of abstract object shapes.

How important is the idea of participatory sense-making in the research on autism?

H: The currently dominant psychological explanations of autism (in the Anglo-Saxon research world, that is) are cognitivist in the main. Theory of mind theory, weak central coherence theory, and executive function seem to have carved up the problem space nicely, and each of them deals with an aspect of the disorder: Theory of mind with the problems of social interaction and communication, weak central coherence with people with autism's preference for piece-meal information processing, and their difficulties with seeing the context and the gist of an events or object, and executive function with repetitive behaviours and the strong need for sameness and structure.

These approaches have some internal problems, one of which is that they see cognition as a matter of information processing, and autism, consequently, as faulty information processing. This makes it inherently difficult to integrate the affective aspects of autism, like the anxiety that many people experience. Another problem is that there is no principled way in which to combine these different theories. They seem to be dealing with aspects that are not intrinsically related. What connection could there be between the social information processing problems and the need for a structured daily schedule, for instance? The big autism researchers, like Uta Frith, are aware of this problem, and have not proposed an adequate solution.

I think enaction – participatory sense-making – can offer something here. It would make sense-making the basis for an integrative explanation of autism. The main and starting question would be “what does this or that mean for the person with autism?” Take echolalic behaviours (this is repetitive speech, e.g. literally repeating what someone else has said, often many times), why does a child with autism do that? In most behavioural treatments, things like this are simply seen as unfitting behaviours, and often treated with the intention of getting rid of them, because they are socially inappropriate. They are seen negatively, as symptoms, and not as positive components of alternative forms of sense-making. This is a functionalist reasoning: the behaviour does not fit in the overall configuration – which is a non-autistic world. But if we look at these behaviours from the point of view of the person with autism, we can ask why they do it. Researchers have found that in the interactive context, echolalia can make sense as a way of expressing affect in response to the actions of others. Another example, when a person with autism looks at something while quickly moving his fingers in front of his eyes, it may be that this makes it easier to see or even look at the thing. This has also been researched, people with autism seem to have a different ‘embodiment,’ their ways of moving and perceiving are different. For instance, they have difficulty perceiving fast movement. Enaction connects this directly to their sense-making, and says that different salencies exist in the world for people with autism. Thus, what we could call ‘autistic embodiment’ and ‘autistic sense-making’ are intrinsically intertwined.

Your work fits into a larger contemporary trend of abandoning a passive-contemplative outlook on the nature of social cognition (which used to be focused on explaining “higher” cognitive activities, including mindreading) and attempting to change it into an approach that would be more participatory-interactive. Still, we would like to know your exact position regarding mindreading as such. Do you think that third-person mental state attribution is simply a much rarer phenomenon than most researchers used to think (e.g. it rarely happens during everyday interactions, but it is sometimes used when passively interpreting fictional narratives that resemble classical false beliefs tasks, for instance while watching Scorsese's "The Departed") or do you take a more radical position and claim that mindreading it is not a real phenomenon at all? If the former is true, then what is your preferred explanation of mindreading abilities? Would it be possible to provide such an explanation within your non-representational, inter-

active theoretical framework? Or do you think that knowing how individual, internal cognitive mechanisms operate would prove to be necessary in the case of mindreading?

E: What is normally described as mindreading – cogitating about the mental states of others through the use of inferences or simulation – is something we indeed do occasionally. Our view is that these acts, however, are not the basis of social cognition, which is demonstrably the position that has dominated the field to date (see our *Interactive Brain Hypothesis* paper for further discussion). We also believe that such cognitive acts are likely rather late developments. And that they require more basic and direct forms of embodied social understanding to be in place both developmentally and contemporaneously. As Shaun Gallagher says, even young infants unable to pass false-belief tests have no trouble interacting with the experimenter and following their instructions. Social understanding is a set of embodied skills, like riding a bicycle, and we become proficient at skills through experience. In the case of social understanding skills, this experience is primarily interactive and participatory, and to a lesser degree observational. So essentially, putting mindreading first is very much analogous to the General Problem Solver strategy in AI in the 1970s. It's upside down. And such an assumption faces almost the exact same problems.

Several interesting and related questions arise if you consider the alternative picture we propose. For instance, we may ask in what situations does mindreading become a useful strategy? If you think it underlies all social understanding, you are blind to this question. How do we achieve this cognitive feat? If you assume that personal mindreading is supported by subpersonal “inferences” or “simulations” – whatever that means – then the resulting explanation has a very shallow gradient, like that of the effect of opium and its soporific properties. What other forms of social understanding are in place when we don't use mindreading? And how do they relate at the level of performance and at the level of mechanisms with mindreading? We believe these are genuine and interesting questions that we would tend to ignore were we to assume the priority of mindreading.

What do you think constitutes the difference between human social cognition and the social cognition that other animals (such as birds or primates) are capable of? Do you think it is possible to completely account for this difference using your preferred enactive, interaction-centered approach?

Both: We would prefer not to start from the differences but to explore the continuum first. Then within the continuum we can start finding, rather than imposing or assuming, the differences. They may be on a gradient or there may indeed be qualitative jumps between different social capacities. We do believe that in humans there are elements that are qualitatively quite different from those found in other animals and that must be explained. They will generally involve sophisticated capacities for reflexivity and for reflection, the influence of socio-cultural normativity and social institutions, and the development of different levels of human identity through mutual recognition.

Recently, you have presented a hypothesis of 'interactive brain', joining the discussion on basic cognitive function of the nervous system. Do you see any possible relationship between your ideas and such concepts as (1) *brain free-energy principle* by Karl Friston and others or (2) *neural re-use* by Michael Anderson?

Both: It's not impossible. What's different perhaps about our proposal is the shift in how we conceive of the brain in the first place. No longer as the seat of the mind, the controller of the body, the place where "everything happens", but as a mediator, a coordinator, playing the role that is not altogether different (conceptually) from the role played by muscles in skillful movement, such as a dance. Muscles enable performance and they are shaped by it in turn. Similarly for the brain, and there is a vast amount of evidence that this is the case. What has happened is that different theories of brain function have so far remained "within" the brain. They downplay the formative role of external whole-agent engagement with the world and with others to that of "context", i.e. something that at most stimulates brain activity, gets it started, and overall must be "understood" by it, and represented. They also downplay the role of the body not only in constraining and enabling cognition and affect but as that of being the very matrix that makes our relation to the world a significant one. Our living bodies are the very reason why we are concerned beings, the key definitional aspect of the mind according to enactivism.

Our interactive brain hypothesis simply applies these insights of enactive theory to the specific case of social neuroscience. We ask how we should re-conceive the brain once we accept that social engagements often enable and even constitute, along with other factors, socio-cognitive performance. It may be that some ideas in other theories of brain function are useful for answering this kind of question. But as theories of brain function, they are not quite enactive until the shift is made in the manner of conceiving the brain as an "organ of mediation" to use Thomas Fuchs' happy phrase.

Sometimes you refer to the distinction between personal and sub-personal processes. However, isn't this division problematic for enactivism? Do you think enactivism is a concept which covers mostly the personal level?

E: Not at all. As a way of thinking about cognition, enactivism has not abandoned the aims of cognitive science, viz. to explain what the mind is and how it works. Therefore, it needs to keep a fluid dialogue between subpersonal, personal and interpersonal levels of analysis. If anything, enactivism takes the meaning of *subpersonal* very seriously and enactive researchers are very careful not to smuggle personal level notions into subpersonal processes (unlike people who speak of representations, simulations, predictions, inferencing, etc, when they speak about the brain or about neurons). That's how seriously we take this distinction. It has been a problematic one for mainstream cognitive science, not for enactivism.

How this works in practice connects to our previous comment about the shifts required by non-linear thinking. Enactivism studies the mutual constraining and relative autonomy of the different "levels" of interest that have been identified to affect a

given phenomenon. In the case of cognition, emotion, action, etc. these involve physiological, neural, environmental, personal and interpersonal aspects as a rule.

Is the term 'social interaction' not too general a concept? It seems that the notion of interaction involves a diversity of topics and aspects of social life. From passing each other in the corridor (which you mention) to intimate relationships between people representing different cultures, different social strata, different religions, or experiences and ways of development. Can the reference to 'social interaction' better explain many social properties, such as reputation?

H: I understand what you mean, but I think this criticism is slightly unjustified. The notion of social interaction may indeed include diverse phenomena but it is strictly defined in our approach, and it is operational, unlike in traditional views. Because of this, it can tell us something about what is common to these phenomena. One of the functions of the definition is as a focusing tool, with which to look at the social domain. We use the idea of social interaction to investigate the social realm in a certain way, from a certain viewpoint. Social interaction processes play a basic role in how we understand each other, how we think, what we believe and how we develop. Integral to our work, though this is not often recognized, is a particular approach to individuals. Participatory sense-making is a whole package, it's not just a focus on interactions. Its assumptions concern the interaction, but also the individuals in their autonomy, and their context, indeed also their societal, cultural, historical, and biological context, and their experience, their phenomenology.

Don't you think that enactivism requires further clarification and separation from the currents and positions with which it only has certain points in common? There are published anthologies, but no good, comprehensive overview of enactivism has been released so far (unless there is one we are unaware of?).

E: Yes, perhaps. Enactivism, in its life-mind continuity, Varela-style is becoming a solid theoretical framework. Much work remains to be done, but different people are now engaged in furthering this work. In part, the lack of a single comprehensive exposition of this framework as a whole reflects the ongoing nature of this work. Concepts like the interactive brain hypothesis, or *readiness-to-interact*, and even other ideas like an enactive approach to co-speech gesture, to the human self and to locked-in syndrome, are very much still under development (part of this work is being undertaken by researchers of the Marie-Curie Initial Training Network *TESIS: Towards an Embodied Science of InterSubjectivity*). There are, however, very good expositions of central enactive ideas, like Evan Thompson's book *Mind in Life*, as well as original motivations and inspirations in the 1991 classic *The Embodied Mind*, by Varela, Thompson and Rosch. The 2010 MIT Press collection *Enaction* shows mainly some of the different disciplinary tributaries to the flow of enactive thinking. It has only become clear relatively recently (at least to us) that enactivism is a non-functionalist approach to the mind. The very questions we want to answer – What makes us agents? Why do we care about anything? What is autonomy? – are the questions that functionalism has failed

to answer. In order to work, functionalism (this includes newer versions like the extended mind), must assume that these questions do not require further explaining; these issues are given and axiomatic, or they are never properly explained and used like a blank check whose value is not hard cash in the bank, but the hope that you can re-use it without questions asked. Enactivism is asking the questions. These relatively recent clarifications about where we stand are still happening and this is one reason why there are no comprehensive single expositions of *all* of enactivism. In a way that's good. A textbook could have the effect of freezing this process. But in any case, expect something along these lines in the near future!

H: I think it'd be great if Ezequiel wrote a basic book on enaction! In our work, we are always very careful to clarify and separate enaction from loosely affiliated ideas that may at first sight have elements in common, but which would dilute the strongest enactive ideas if they were uncritically assimilated. I think that this work is very important indeed. What you do get, then, is that people will find the work too radical, and feel compelled to react to that. This does not often lead to interesting criticisms or discussions, because the reaction is to the felt radicalness, and can therefore be quite reactionary. It can also make people talk past each other, because they each want to convince the other that the very basics of their approach are wrong, when it doesn't happen often that people will change their basic ideas about something. Therefore, indeed, I think it would be great to have a kind of basic book on enaction, which lays bare and shows, utterly clearly, its roots, so that we can point to that when there are such misunderstandings again. The debates between representational and functionalist cognitive science on the one hand, and enaction on the other, are good to have, but they are not the ones I am most interested in. They can keep you from doing the advanced work on your terrain. As for books, of course there are some important ones out there – like Ezequiel mentioned, *The Embodied Mind*, Evan Thompson's *Mind in Life*, and the MIT Press *Enaction* book are standard works. But we could do with a state-of-the-art text that is very clear about the fundamentals too.

How would you describe your cooperation with such experienced researchers as Shaun Gallagher, and with younger ones – for instance - with Tom Froese?

H: What I find amazing is how much you can learn from other people. I am always amazed at other people's knowledge and styles. One thing I find myself very interested in these days is the methods of work that other people use. Then I don't mean just learning about phenomenology, or neuroscience, or sociology, I also mean their methods of studying, of reading, of writing, of presenting. I find that this is something hardly ever talked about, and I miss that. One can sometimes feel alone in figuring out how to do the day-to-day work. The only way to learn about this is by working closely with someone, actually seeing them at work on a daily basis. This happens too little, in my view. Though right now, in San Sebastián and in the *TESIS* network, we have a close-knit group of researchers, where we also seem to be able to talk about these aspects of the work.

What I also like about collaborating with many different people is that the interactions are always so different, and that they all somehow work, but that you need to do different work in each case to make it all run smoothly. I also love it when the collaborations do not just happen over email, but in actual, live, meetings. Then you so often see participatory sense-making happen! That excites me. The notion that you can hold on to an idea, take it to be yours and yours alone then so quickly fades away. And it's ok, because understanding something with someone else, in a conversation, in working it out together, can lead to so much more insight. It's also better for the development of knowledge and insight more generally. One difference that I think you'd hope for there to be between younger and older researchers is that the more senior ones might be more relaxed about their CV's, and can focus more on the ideas. But in having talked to some of the professors, I find that they also are still struggling for recognition. This I think is a pity. It's a pity for young people to have to be so career-driven, but when you notice that even the big professors seem to still need to do that... That gives little hope for ever focusing in a relaxed manner on the real, important stuff of research.

I also like learning about collaboration, and research culture. Recently I learnt a lot about this from psychologist Vasu Reddy and my visits to her department in Portsmouth. The openness of that place is amazing, and so inspiring. Everybody will talk to you when you're a new face, and people are often up for thinking about your ideas with you, maybe setting up a collaboration. I think this is the way to go. Many of the young people in enactive research think like this too, *horizontally*, in terms of collaboration and sharing, and this is good.

Are you satisfied with the new generation of scholars interested in enactivist ideas?

E: Very much so. It's just amazing to see so much energy and creativity. Much of this work is still largely unknown. Some of these young researchers are still preparing their work, finishing their PhDs, getting their first publications out. (We've already mentioned the ongoing *TESIS* network). Expect some very interesting surprises over the coming years. What I find most encouraging is how much the young enactivists are ready to embrace interdisciplinarity and to listen and learn from other ways of thinking. There isn't a single researcher that could be described as enactive that does not combine in their work at least two traditionally independent strands of learning: philosophy and neuroscience, biology and computer science, psychology and sociology, psychopathology and phenomenology, systems thinking and critical theory, etc. Not one.

H: Satisfied seems to me a word that sounds like the collection of new researchers is full already. I hope there are many more to come! I do love people's enthusiasm, and it is very nice to come together and do real, constructive work. By constructive I mean, work on a basis of shared ideas and vision, and within that shared framework, to work out concepts, methods, experiments, in a critical manner. Many of the people I know are very, very capable and enthusiastic. It's a pleasure to work with them.

How do you spend your free time? Are you as sociable as your research idea?

H: Haha, this is a funny question. I like it. I'm not sure the research is actually so very sociable. One thing that tends to be ignored when we stress the role of the interaction in intersubjectivity, is that the *subject* is very important in our work too, the individual. Both sides — interaction and individual — are autonomous in our approach, and are dependent on each other for their autonomous organization. In my free time, I like to be with people, for sure. Though living far from my family and many of my friends can make contact somewhat restricted. I don't see some of my best friends very often. This can be hard. I do think I depend a lot on deep connection with others for my well-being. But I also like, and need, to spend time alone. I spend a lot of time just thinking, I think. But maybe you're asking what activities I like to do? I love driving around the country, exploring it. Just recently, I saw some beautiful mountain tops and passes in the Pyrenees, not too far from here. I most love to do this together with someone. I also love dancing, swimming in the sea, and cycling. They give me a feeling of freedom. For me, living life and investigating it are not very far from each other. I like to be connected in general, and one thing that can really bring that about for me is art.

E: I'm pretty much of a hermit and slightly anti-social! I tend to cringe away from small-talk but very much value deep connections to others. I spend most of my time reading and trying to understand life. They say that sometimes we need perspective to truly understand something. I get it from contact with nature, the gaze of some animals and the way art can sometimes change you.

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