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MUTUAL INCORPORATION, INTERCORPOREALITY, AND THE PROBLEM OF MEDIATING SYSTEMS

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ABSTRACT. In this paper, I explore the ways that phenomenological concepts like intercorporeality and mutual incorporation offer new tools in trying to make sense of human experiences via mediating systems. In particular, I think about how the COVID-19 pandemic hastened a large population into mediated interactions, and what is lost, perhaps contingently or perhaps intrinsically, when human experiences are mediated in this way. I look to research in presence, skillful interaction, and enactive social cognition to argue that there remains something ineffable or at least extremely hard to pin down about intercorporeality, and embodied togetherness has not yet been replicated in the mediating systems we currently embrace.

Keywords: intercorporeality, participatory sense-making, mediating technologies, presence.

Introduction

Several years into a global pandemic, we've all seen how important in-person interactions are to most people. Everyone wants kids in classrooms and not on Zoom[2]; they want to go to concerts and to see friends at bars (again, not on Zoom), and academics are generally missing the in-person interaction usually enjoyed at conferences around the world, replaced, once again, with Zoom. While

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[2] Zoom is used throughout this paper as a shorthand for teleconferencing applications that have a real-time video component. Other such technologies include Microsoft Teams and Skype. Zoom is used as the shorthand simply because it was the most prevalent software of this type used during the years of the pandemic (2020-ongoing).

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the pandemic made this experience more widespread, even before this it had been clear that there is something special about being in the room for certain kinds of interactions. The gulf between going to hear someone speak in person and watching a video of it is unbridgeable, and the same is true of concerts; there's something profound missing from virtual shows that cannot replicate the experience of being present in the space. There is something about presence that matters for interaction, and it matters enormously, as evidenced by a long history of studying the concept of presence in a number of different contexts. However, neither presence nor interaction are uncontroversial concepts, particularly in light of rapid changes in humans' uses of so-called telepresence technologies. So what, then, are these technologies (like Zoom) doing to our abilities to engage in rich social cognition, and what effect do they have on something like our lived experience of being together? Flipped around, what is it about our lived experience of co-presence that is so difficult to replicate with these technologies? These questions have been approached from a number of different methodological concerns for many decades, but the unique interplay of concepts that I introduce here will hopefully guide future research in new directions, especially in the cognitive science of social cognition.

To be clear, while this is an argument about embodiment, it cannot be overstated how important it is to understand that there is no single body form we all share or that this argument demands be present in the interaction. Bodies vary widely, and this argument is about lived embodiment, not the lived body, as if there were only one (Zebrowski, 2009). Any talk of gesture, for example, might show up in radically different ways depending on culture, situation, or bodily form, among others.[3]

I'd wager that everyone reading this likely experienced at least one class, meeting, conference, lecture, or social engagement over Zoom during the last few years. Indeed, I wrote this article for conversation at the first in-person academic event I have experienced in over two years; the rest have been on Zoom as a result of COVID-19. When you're on a Zoom call, you are staring at your computer screen. But if you are looking into the eyes of the speaker on the call, they cannot be looking into yours, because of the placement of cameras on computers. It makes direct eye contact currently virtually impossible. Additionally, our normal ways of just shifting our weight when we're standing, or moving our arms, or even just swaying slightly in time with the people with whom we interact when we are in the same shared corporeal space, are all missing from these interactions. Different behaviors may even emerge on

[3] This disclaimer is here in recognition of important work on embodiment done by the disabilities community, and a reminder that any talk of "the body" is metaphorical talk, given the richness of forms of human embodiment in the world.

Zoom, with exaggerated nods or facial expressions so whoever you are interacting with knows more about how you are experiencing the interaction in the absence of all the usual clues. But as a result of the different expectations and capacities we have on a Zoom call versus in shared corporeal space (in which a much more direct interaction takes place), we have to ask what sorts of cognitive and phenomenological absences might arise with this rapid change.

Beginning as it does with Merleau-Ponty's phenomenological insight of intercorporeality as a special sort of embodied resonance or co-presence, this paper is not an empirical investigation of this topic, but instead is an attempt to reframe the debate and synthesize a new framework. I combine here multiple kinds of evidence to ultimately argue that the reason so many of these telepresence technologies fail to induce a kind of lively presence is that our embodied perceptual skills fail to raise many of the technologically-mediated interactions into a kind of direct interaction. I see my contribution to this debate as an attempt to bring together a number of disparate literatures on presence and embodied interaction to show that we still lack a precise understanding of the nature of the ineffable "we" that emerges in true direct interaction. This work promises to have impacts in both cognitive science and social cognition, and it reflects the most current understandings of the nature of the mind. Because this paper combines work from different traditions and attempts to smooth the jargon into more usable language, each piece must be introduced in context. The paper proceeds as follows: in section 1, I discuss the idea of presence itself, and try to situate a few of its complicated historical uses into a more familiar context so we can redeploy its use with more precision for the problem of mediated interactions. Then, in section 2, I will look to the idea of skillful interaction as a way to make sense of our experience of presence and perception itself as a skill, showing how Zoom ends up being a failure of that skill because it models direct interaction without actually facilitating it. In section 3, I introduce the enactive concept of participatory sense-making as a way to understand the stakes of social cognition and direct interaction in these terms. In section 4, I delve into the key concepts of intercorporeality and mutual incorporation, discussing how these phenomenological ideas can begin to show us the impacts of direct interaction. Finally, in section 5, I synthesize these ideas into one new argument that suggests a need for empirical work that studies these sorts of embodied interactions within the framework of presence, in order to more precisely study the unquantifiable, ineffable "we" of phenomenology and intercorporeality that appears emergent only in direct interaction. In section 6, I include a brief discussion with questions for future research.

Section 1. Presence

The term "presence" has a complex history, and is often used to conflate a number of different-but-related ideas in scholarly literature. Writing in the context of telepresence, or presence in virtual environments in particular, Slater (2003, p. 1) points out, "distinctions should be made between immersion, presence, involvement, emotional response, [and] degree of interest." Of course, in coining the term telepresence, Minsky wrote, "Telepresence emphasizes the importance of high-quality sensory feedback and suggests future instruments that will feel and work so much like our own hands that we won't notice any significant difference" (1980, p. 44). Such instruments remain largely a fantasy, much like the science fiction on which Minsky based this idea. But real-time videoconferencing software has become commonplace, and it gives the appearance of direct interaction. What I mean by direct interaction here will become clearer as I introduce the concepts that build up to it, but the key features are an active sort of felt presence, perceptual skill in the relevant environment, and the possibility of a sort of social cognition that includes genuine meaning-making between people (or autonomous systems, more broadly).

The academic journal *Presence* has persisted for almost thirty years, and the International Society for Presence Research has existed for twenty, and both are focused around presence *as* telepresence. In other words, presence in this sense is understood to be similar to, but distinct from, immersion. Slater (2003) likens immersion to the objective, measurable sense of being-in-place, while the more subjective perception of that experience is more properly understood as presence. Slater later revises this slightly to include parameters for the measurement of presence, although his concept remains distinct from how I'm deploying it here (Slater, Lotto, Arnold, and Sanchez-Vives, 2009). This distinction is important for our purposes largely because the concept of presence is not used consistently even within longstanding presence research, and it is further complicated when the term is deployed for a different sense within enactivism. Noë, whose work I will draw heavily on here, says, "the chief problem in the whole domain of the mental is presence… [but] presence does not come for free. It doesn't happen in us. We achieve it. Or rather, we enact it" (2021). It is this enactive sense, which overlaps in part but not whole with the telepresence sense, that complicates this story. Here, when I ask about the nature of direct interaction that includes a sense of felt presence, something like Zoom seems to fulfil both of these definitions. It is a kind of telepresence, in that you're speaking to someone in real time and seeing and hearing them somewhat

as you would if you were in the room together, but it hits up against Noë's sense, in that when we attempt to deploy our perceptual skills in service of interaction via a technology like Zoom, we do not successfully achieve it or enact it, in full. This is in part because of the nature of skillful interactions as they are understood in contemporary embodied cognitive science, as I will argue here.

Looking closer at Noë's examination of presence, he draws from Heidegger, who talks about the carpenter's hammer and the way it recedes from being present. It famously becomes invisible in use, as the hammer's presence in awareness would hinder the ability of the carpenter to successfully use the hammer. Noë calls this a "lively absence" (2012, p. 9) instead of an actual complete absence. The hammer is "there, after all, for the agent; [it is] within reach; [it is] taken for granted, relied on" (*ibid*). In contrast, something like the books on my desk in Wisconsin, USA are absent in a dead way to a family in England I have never met and who do not know I exist. In this way, Noë sets up this distinction between absent presence/lively absence and a dead absence. I will argue then, that if the hammer is a lively absence, something like Zoom itself is a dead presence: a thing that appears to be there with you, not receding into the background, but actually interfering with what should otherwise be a different kind of direct interaction, a much more present presence.

With apologies to the reader for the jargon in use, there is one more concept from Noë that will help us make sense of the situation of impeded interaction via mediated technologies. Noë talks about pictures, which are related to something like Zoom calls in some obvious ways. He asks us to imagine holding a photograph of Hillary Clinton. What is the difference between looking at the person in that photograph and being in corporeal space with that person? He says, "Hillary shows up for you, in relation to you; she is present in the picture; but she is present—and this is the key—precisely *as absent*" (2012, p. 85). In other words, the presence of the person in a photograph highlights the very ways the presence is limited. Pictures have a very distinct nature in this way. Their presence-as-absence simultaneously offers a kind of presence otherwise out of reach, but also reminds us that this is not the same kind of intercorporeal presence that we need for intercorporeality. In this way, I would argue that Zoom calls and other telepresence technologies lie somewhere between these two. It is a presence-in-absence that hides its nature, as the designers intended to make you feel as if you were engaging in straightforward presence. But it is missing the kinds of skillful engagement and access we have to the lived world, and the person or persons we perceive during the call are not available to us in the way they are in shared corporeal space; instead they are a strangely dead presence.

They are here; we can speak to them, interact with them, but in some way that appears mysterious under the terms of the phenomenology we look to, they remain inaccessible to us[4].

Section 2. Skillful Interaction

In his 2012 book, Noë is concerned with the nature of mind at the intersection of perception and phenomenology, an intersection long theorized and examined in both philosophy and psychology. Drawing on Merleau-Pontian arguments about how we manage to see the whole tomato when our visual system would seem to only have access to the front of it, Noë looks to skillful engagement. He says, "The world shows up for us in experience only insofar as we know how to make contact with it" (p. 2). He goes on, "The world shoes up for us. But it doesn't show up for free… We achieve access to the world around us through skillful engagement; we acquire and deploy the skills needed to bring the world into focus" (*ibid.*). Perception, on this view, is not the passive receiving of information that is then processed by the brain, spurring some motor output, in the traditional information processing model of the mind. Rather, perception here is a kind of transaction, and an embodied, enacted way of being situated in our worlds. The first hint at where something like Zoom might go wrong in attempts at direct interaction appear here: there is a way of being situated, a transaction, a way we achieve presence, and it's yet to be established if the skills we have with that kind of interaction in our everyday world translate into mediated spaces, especially mediated spaces like Zoom. In these mediated spaces, it is impossible to achieve direct eye contact, your posture is limited, and you have the inability to know that someone is looking at you and not something else on the screen. If we "experience what is available from a place, and the ground of availability is our skillful ability to reach out and take hold of the world before us" (p. 95) then I would argue that it makes perfect sense that our skills in the world as such might not translate directly into mediated spaces, considering how we spend our lives in a rich, embodied world, thick with meaning, and we (as a species, and for many of us,

[4] Noë does address some of these virtual and technological artifacts and their relation to this idea, but he accepts them as simply increasing the scope of our access, and therefore increasing the possibility of presence for the things or people we engage this way (83). I disagree here; we may someday develop the skillful engagement with Zoom that we have with other people in real space, but we almost certainly do not have it yet, and it is unclear if the technology as it now stands permits this possibility at all, particularly if we find intercorporeality to be essential, which I believe it is.

developmentally as well) have only relatively recently begun interacting in Zoom-like mediated spaces and trying to adjust our perception of the narrowness of what we are shown.

Noë, in his earlier work (2009), points out: "The environment itself is what enables me to find my way around in it. My understanding, my knowledge, is not something autonomous, something detachable. Rather, it is a skillful familiarity with and integration into the world" (p. 82). This also calls up Chemero's use of sensorimotor empathy in the place of knowledge, re-emphasizing the importance of that lived bodily interaction (2016). In each case, we are kind of misled by the kind of interaction Zoom offers us. We think our environment is the room where we are, and our skillful engagement with the world itself is simply our everyday skillful engagement. But our sensorimotor and perceptual skills used in direct interaction do not carry over as easily as we think they do, and hence our experience is qualitatively different. Think again about countries where the pandemic brought forth innovation for classrooms and the arts and businesses in the form of mediating technologies. At first, people were thrilled to be able to recapture some of their normalcy. But it did not take long (at least in the US) before calls came demanding that students be back in classrooms, in shared corporeal space, and that concerts resume and bars reopen, because our Zoom social calls were somehow not fulfilling the same need. And there are undoubtedly many layers to this problem, only one piece of which I'm trying to make sense of here, but when we think about the enactive social cognition that tells us how shared meaning-making works, we can began to see why we should care so much about understanding this complex issue and moving toward building the kinds of technologies that might provide actual access to that lived shared space, whatever that might look like.

Section 3. Enactive Social Cognition

Traditionally, the field of cognitive science understands social cognition to be an interaction among at least two people, driven by the intentions and cognition of each individual, playing a role in the exchange. The mind remains Cartesian, internal, unseen, and inherently private. But increasingly, there are attempts to recognize that social cognition is not merely two minds at an interface. Those minds are embodied and embedded in a world, physical, social, and cultural all at once. Yet Fuchs and De Jaegher (2009) point out that "even though simulation theories increasingly include the body in the modeling of others, they still do not take into

account the *reciprocity* of embodied agents" (p. 468). In other words, the way those bodies interact and come together to form entirely new systems, themselves needing to be modeled as part of (and perhaps *as*) the interaction.

In 2007, De Jaegher and Di Paolo wrote a groundbreaking paper about enactive social cognition, in which they described the unique interplay between autonomous systems (people), which themselves can spin off a new autonomous system (the social interaction), which is constrained by the individual interactors but not controlled by them (insofar as the intentions of the people acting do not control the social interaction itself.) We are asked to consider two people walking in opposite directions down a narrow hallway, and how oftentimes the interaction takes on a life of its own, frustrating the intentions of each individual, who wants to merely pass by the other and continue walking. Instead, they often end up mirroring one another's movement, as the interaction takes on the properties of autonomy, along with the needs and constraints to perpetuate the interaction for some amount of time. They called this "participatory sense-making" as a way of centering the cognitive process occurring in these kinds of social interactions.

Again, traditionally in the field of cognitive science, the idea has been that social cognition involves two separate individuals, whose cognition is still private, being influenced or affected by the interior mind of the other through the interaction. But what De Jaegher and Di Paolo have suggested is that the interaction itself takes on a level of true autonomy. This new level can be modeled using dynamical systems theory, and constitutes a genuine new level of autonomy in the interaction. Importantly,

> This means that the sense-making of interactors acquires a coherence through their interaction and not just in their physical manifestation, but also in their significance. This is what we call *participatory sense-making*: the coordination of intentional activity in interaction, whereby individual sense-making processes are affected and new domains of social sense-making can be generated that were not available to each individual on her own (2007, p. 497).

This last piece is probably the most important for our purposes here; we need to understand the constraints necessary for this kind of coordinated exchange to make possible new dynamics for cognition that were inaccessible to individuals. Being together matters at multiple levels, and we need a more precise way to model how direct interaction requires (or doesn't) intercorporeality and shared corporeal space to enable something like participatory sense-making. Part of this paper's project is to make distinct some of the rich messiness involved in these concepts. There is empirical work that supports many of these ideas, but it generally

does so within specialized domains, or by focusing on the problem-solving aspects that dominate social cognition rather than thinking about that shared corporeal space, and this is largely true because the phenomenology is, by its nature, irreducible to some simple outwardly-measurable metric.

Section 4. Intercorporeality and Mutual Incorporation

The idea of intercorporeality comes to us from Merleau-Ponty. He says, "my body annexes the body of another person in that 'sort of reflection' it is paradoxically the seat of… The other person appears through an extension of that compresence; he and I are like organs of one single intercorporeality" (1964, p. 168). And again, this source material, while capturing the idea of what's at stake here, does not lend itself well to being broken down into small components that can then be studied in a lab. In fact, we hit against old philosophical problems of consciousness when we attempt to do so. But this paper aims, again, to bring together these otherwise-disparate ideas and show how they work together to paint a picture that is richer than each alone, and that can help us make better sense of that direct interaction involved in lived, bodily experience of the type we've been discussing. In their recent book on the topic, Meyer, Streeck and Jordan (2017) highlight the real stakes for this discussion. They say,

> intercorporeality [is] a … radical and coherent conception of the human body as being *constituted* by its corporeal relations and interactions with other human or animate bodies… intersubjectivity – the phenomenon of understanding, of sharing minds – is always – and always in specific ways – embedded and experienced in concrete, intercorporeal action (xviii).

It is the emphasis on the constitution here that's so important, and if we take this seriously, we understand why we're overdue to try and integrate these ideas into our sciences in a serious way. Sitting on a Zoom call with a friend is better than being stuck in a kind of solitary confinement without any such human social interaction, but it would seem something vital remains absent and it is my hope that we can further understand the role of intercorporeality in this question. This radical intercorporeality is not easily quantifiable, but there is a way we can obviously and easily see what is lacking in telepresence technologies when we think about what that lived experience of shared corporeal space is like. Meyer, Streeck and Jordan go on,

> Merleau-Ponty emphasizes the fact that… we are still able and even fated to continue experiencing the bodily presences and sensations of others when we share the same sensory and corporeal space. Examples of this kind of intercorporeality are ubiquitous and include… people waltzing, paddling a canoe, playing a piano duet, or making love, as well as the most basic forms of human interaction including eyes meeting, bodies embracing, lips kissing, or voices uttering and being heard in turn (ibid., xxi).

This is the ineffable "we" that remains so elusive in our telepresence and so unavoidable in our human interactions that it goes by almost invisibly sometimes.

If we think about participatory sense-making as described in section 3 as being the outward and measurable dynamic system that emerges when two people are in the right kinds of sense-making relations, then mutual incorporation is sort of the phenomenology of that interaction, or the intercorporeality present in those dynamics (Fuchs and De Jaegher, 2009).

We need to understand embodied beings, enacting perceptual and sensorimotor skill in interaction, generating new dynamics that are autonomous in their own right, and might persist regardless of the intentions of the individual interactors. Even more, gesture, here, is not an added communicative technique that supplements spoken language, but is inherently meaningful in ways that much telepresence technology research largely overlooks. One way Fuchs and De Jaegher talk about this is that "movements become interpersonally coordinated through attempts at understanding each other, which is an effort to create and align misunderstandings. This is based on the 'visibility' of intentions-in-action. Grasping, pointing, handing over, moving towards, etc., are all inherently meaningful and goal-directed" (p. 471). Think about most of our commonplace telepresence technologies again. Zoom interactions stifle that vast majority of commonplace ways of interacting bodily with others, in ways that invite an actual synergy or resonance in the intercorporeal sense. If gesturing is an activity you do when not on Zoom, you're likely to still try to do some of it when you are on Zoom. But much of it will be unseen by whoever else is on the call, and those who can see any of it will get a partial view, in part because so much of you is not actually present in that Zoom call in any genuine way, and so your perceptual and skillful engagement with the moment is not easy, not rich, and not complete.

Section 5. Synthesizing these ideas

While so much work is being left unsaid and undone here, hopefully these ideas are starting to come together to paint a bigger picture of the gaping hole in our research that ties these levels of description together. You can see why so many

of us found suddenly recording lectures to later be watched (or not) by our students in a pandemic felt so empty. As Meyer, Streeck, and Jordan remind us, "…examples of intercorporeal processes – that is, activities in which the single body's agency is subsumed by the production of a *We*, and would be pointless without the simultaneous participation of an other" (2017, xvi). The co-presence understood by Merleau-Ponty, along with contemporary research in enactive social cognition and presence in all its manifold understandings emphasizes the importance of bodily engagement in shared corporeal spaces that the telepresence technologies have not yet replicated. The question remains whether they could replicate it – truly replicate it rather than just invoke some of the phenomenal feelings of co-presence. These ideas weave together to form a complicated braid not easy to unwind once entwined. Noë's use of phenomenology to enrich our understanding of perception, especially the experience of perception, which is always more than the objective eye-tracking data (for example) can provide, offers us new conceptual tools to help us understand the kind of presence we experience on something like Zoom as a dead presence, contra his "lively absence".

In addition to the "dead presence" inspired by Noë's "lively absence," we might also understand these direct interactions as the mutual incorporation that Fuchs and De Jaegher describe. The alternative, then, is something like unidirectional incorporation, which they understand as handling tools (the traditional example of the blind man's stick from Merleau-Ponty, perhaps.) Zoom, then, might not be a space for an interaction at all, but instead a tool, or rather, multiple tools, being accessed by each individual on the call, again giving an appearance of a rich interaction but completely absent the presence and intercorporeality needed. Zoom might be a *model* of an interaction, rather than a participant or facilitator of a true direct interaction (Another analysis, beyond the scope of this short piece, might be to explore Zoom as a kind of secondary intersubjectivity masquerading as a primary intersubjectivity.)

Section 6. Discussion and questions for future research

One reason it's difficult to think about how to empirically test for something like intercorporeality, particular in mediated technologized spaces, is that it almost axiomatically rules out their intersection. But that doesn't mean the book is closed, and technologies of presence are bad and cannot be saved. But it does mean that empirical research needs to proceed cautiously, and with a full accounting of the theoretical underpinnings provided by work in intercorporeality, participatory

sense-making, and research, both empirical and theoretical, from the long-standing presence community.

There are many pieces of empirical work that support the claims in this paper, but each does so by taking a small piece of the overall puzzle and testing it out rather than approaching the rich messiness of something like intercorporeality. The tools for analysis, then, are extremely hard to pin down. How do we capture something we suspect is fundamentally ineffable? As can be seen by the Cartesian understanding of the mind held by so many in the face of common sense, a strong enough theoretical foundation should show parsimony with contemporary research even if we cannot truly rule it right or wrong. Some of the relevant research here includes: Keating E. (2017), who asks a very similar question to mine but examines it differently, still concluding that mediating technologies raise challenges for something like intercorporeality; Riley et al. (2011), who describe high-level interpersonal synergies and the dynamics that occur within them; Candadai et al. (2019) who describe the role of social interaction as it relates to the behavioral and neural activity of the individuals involved, showing that "during social interaction, the neural controllers exhibited dynamics of higher-dimensionality than were possible in social isolation. Moreover, by testing evolved strategies against unresponsive ghost partners, we demonstrated that under some conditions this effect was dependent on mutually responsive co-regulation, rather than on the mere presence of another agent's behavior as such" (1). We can also appeal to Reed et al. (2006) who showed through a paired target-acquisition task that even in the absence of knowing if you were in the experimental condition where you were tethered to a partner or not, the dyads solved the problem more accurately and more quickly than the singles, in spite of real and perceived irrelevant movements. Auvray et al. (2009) showed a similar effect with a very different experimental setup. What I hope is that we can become more precise in terms of the questions and concepts we're using here, in order that we can try to make sense of the richness of intercorporeality and why it seems so incapable of being replicated through mediating technologies.

I have intentionally left out discussions in cognitive science and philosophy about what has come to be known as the extended mind hypothesis. This seems particularly relevant as part of what's at stake here is a mediating technology that, in principle, might merely extend the minds of each interactor and function as a space in which intercorporeality and mutual incorporation might still take place. However, this seems misguided to me in a number of ways for reasons that go beyond the scope of this paper. For some re-framings of that debate, see Hayles (1999); Di Paolo (2009).

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