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# The Devil's in the details: Mental institutions and proper engagement

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Deborah Tollefsen [a,*], Rick Dale [b], Lucas Olsen [a]

[a] University of Memphis, Memphis, 327 Clement Hall, TN 38152, United States
[b] Department of Philosophy, University of California, Merced, 5200 North Lake Road, Merced, CA 95343, United States

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**Abstract**

In the "Socially Extended Mind," Shaun Gallagher further develops the theory, introduced in "Mental Institutions" (Gallagher & Crisafi, 2009), that social institutions can become part of a cognitive system. Building on first wave theories of the extended mind, Gallagher (2013) argues that just as our minds are capable of coupling with artifacts in the environment to form larger cognitive systems, our minds are also capable of coupling with social institutions. In this paper we argue that whether extending cognition in this way is fruitful comes down to the details. Systems are incredibly complex, and must be addressed at the local level where components concretely link up. Only after such work is done can we confidently claim that something as abstract as the "legal system" constitutes the mind. Published by Elsevier B.V.

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## 1. Introduction

In the "Socially Extended Mind," Shaun Gallagher further develops the theory, introduced in "Mental Institutions" (Gallagher & Crisafi, 2009), that social institutions can become part of a cognitive system. Building on first wave theories of the extended mind, Gallagher (2013) argues that just as our minds are capable of coupling with artifacts in the environment to form larger cognitive systems, our minds are also capable of coupling with social institutions:

> Just as a notebook or a hand-held piece of technology may be viewed as affording a way to enhance or extend our mental possibilities, so the use of various institutional procedures and social practices may offer structures that support and extend our cognitive abilities. (p. 1)

While we are sympathetic to the idea of a socially extended mind, we believe that without further elucidation Gallagher's theory is susceptible to the charge of explanatory redundancy.

## 2. Levels of description and explanatory redundancy

Gallagher (2013) defines mind as a "dynamic process involved in solving problems and controlling behavior and action – in dialectical, transformative relations with the environment," instead of as a "repository of propositional attitudes and information, or in terms of internal belief-desire psychology" (p. 6). Whatever serves the ends of these transformative processes is constitutively cognitive on Gallagher's (2013) account:

> Cognition is not about content (whether non-derived or derived) being carried by vehicles (whether neural or extra-neural), but is an enactive and emotionally embedded engagement with the world through which we solve problems, control behavior, understand, judge, explain, and generally do certain kinds of things. (p. 13)

* Corresponding author.
*E-mail addresses:* dtollfsn@memphis.edu (D. Tollefsen), rdale@ucmerced.edu (R. Dale), lolsen1@memphis.edu (L. Olsen).

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Because certain social institutions – for instance, the legal system—enable cognitive processes that would not otherwise be possible, we must, according to Gallagher, acknowledge the existence of mental institutions with which we couple and form an extended cognitive system. Mental institutions are the means by which we engage in many forms of social cognition.

A mental institution, in addition to enabling cognitive processes in a constitutive manner:

(1) includes cognitive practices that are produced in specific times and places, and
(2) is activated in ways that extend our cognitive processes when we engage with them (that is, when we interact with, or are coupled to them *in the right way*). (Gallagher, 2013, p. 4)

Gallagher's main example of such forms of social cognition is the legal system. Our legal system not only facilitates many of our cognitive processes in legal matters, without the legal system many acts of cognition would not be possible.

In order to clearly grasp what Gallagher means by constitutive (described by item 2 above), let us consider the act of making a legal judgment. Such a judgment is an act of cognition, and it would not be a legal judgment at all were it not to take place within a certain legal system and be guided by certain laws, rules, and procedures. This is the sense of constitutive that Gallagher seems to have in mind. A constitutive element is one that, were it to be removed, the process would not be what it was. Since mind is a dynamic process, whatever enables new processes thereby constitutes a new mode of thinking. If constitutive factors are removed, then the abilities of the cognitive system change.

At one level of description it seems true that we interact with social institutions and practices. But such descriptions are true only in virtue of the fact that we interact with various artifacts and people. We do not engage with the legal system *simpliciter* but with aspects of it through interaction with physical artifacts that represent or convey the law (e.g. a law book, a court report) or with people that play particular roles within the legal system (e.g. a judge, a lawyer). Every engagement with an institution is mediated by, potentially, three things: institutional members, pieces of technology (including tools and artifacts), and institutional spaces.

Acknowledging this, however, opens the door to the charge of explanatory redundancy. To engage with an institution *is just* to engage with people and technology, within a space designed for such purposes. But then why talk of interactions with social institutions? If we want a cognitive science of extended mind, a science that provides us with an understanding of the causal interactions that are constitutive of cognitive systems, then we will have to get down to the level of actual causal interactions – actual couplings. Talk of coupling with institutions, then, seems explanatorily superfluous.

## 3. What makes a system?

As Gallagher notes not all engagements are proper engagements. Whether one is coupled to an institution depends on whether one is coupled to it *in the right way*. Gallagher does not say much about what that could mean. If the notion of proper engagement is going to help us avoid the problem of cognitive bloat, further details are needed. To introduce the notion of "proper" or "right" is to introduce a normative assessment. But by what standards are we judging proper (improper) or correct engagement? Consider the following example: Suppose there is a hacker that infiltrated the legal system – changing verdicts, contracts, laws and so on. Is this proper engagement with the legal system? Are they engaged with the legal system in the right way? If proper engagement means proper causal engagement, rather than legally proper or socially proper, then we need to hear more about the casually right way to engage with a system in order to avoid cognitive bloat. A historian researching an ancient legal code is surely causally interacting with various artifacts, but do we want to say that her mind is coupled to this ancient legal system? This seems counterintuitive since this legal system no longer exists.

One way to get a grip on "engagement in the right way" is to consider available definitions of what makes a variety of entities, taken together, to be one and the same system. In cognitive science, the term "system" is used across a range of levels. Consider some simple examples: Neuroscientists often refer to the basal ganglia *system*; the basal ganglia, inferotemporal and striate cortices are all considered part of a single central nervous *system*; our arms and hands, along with our brain, may be characterized as parts of our bodily *system*; the embodied and enactive approach would consider our body and immediate environment as part of the cognitive *system*. Even in cases without obvious physical connectivity – such as two persons in a conversation – we may also consider them to be part of the same system: a conversational, or perhaps a dyadic, *system*.

This dyadic system suggests a constitutiveness of one person into another's cognitive system. From the "first wave" extended-mind perspectives, a social agent can be seen as part of someone else's cognitive system (Tollefsen, 2006). In "transactive memory" research, one person's memory can be seen as dependent upon the functioning of another's memory, as a kind of two-person, socially-extended memory system (e.g., Wegner, 1987). But in this "second wave" extended mind, Gallagher emphasizes how external artifacts or entities *enhance* or *make possible* cognitive processes or functions that would be impossible without them. Relieving ourselves of the parity principle, we can look to institutions or other complex, large-scale social and cultural institutions as parts of our cognitive

system when they function with us *in the right way*. How are different things part of the same "system" when they interact in the right way?

Some basic definitions of "system" will help us get a grip on how its components interact in the right way. In the domain of systems science, diverse definitions of "system" have been proposed, but centering on the notion of an assemblage of mutually interacting components that self-organizes and self-sustains. Wiener (1948), Von Bertalanffy (1950), Ashby (1956), and Mead (1968), and other precursors to cybernetics and modern systems theory (Meadows, 2008; Ramage & Shipp, 2009), all identified systems with a congregation of components that are joined together and continually interact in ways that can be studied in whole; and a "systems view" as one that emphasizes the principles and results of such influence "in-whole," rather than aiming only for reduction of a system to its component parts. This is perhaps one of the more common notions of "system." In this framework of thinking, there is an emphasis on the *dynamics of coordination*: How do components of the system mutually influence each other through time? And how do they bring the system to various stable states, or induce transitions between different stable states? For example, we can study stable states of economies, political systems, and even, in cognitive science, stable "resting state" patterns of brain activity. We can also study how the various components making up these systems, when perturbed or influenced in some way, bring about radical reorganization of the system in-whole (such as a financial crash, or a radical change in the nature of the brain's activity).

This sense of system seems to be implied in Gallagher's (2013) discussion, as there is clearly an emphasis on the mutual dependence between the social systems and cognitive agents he discusses: "The legal system is constructed in part in these cognitive processes" (p. 4); "...tools, technologies, and institutions often shape our cognitive processes," (pp. 6–7). In addition, it seems to us that this is the only sense of system with sufficient force to suggest that institutions can be constitutive of cognitive processes. The remainder of our discussion will assume this notion of a system from general systems theory and complex systems science.

So how does one determine what parts are interacting? According to Meadows (2008), in a popular primer, an important way of engaging in such "systems thinking" is to explore patterns of interconnectedness in a proposed system, which can be more challenging than simply seeking a comprehensive enumeration of its parts. When looking to the legal system, it seems true that it is interconnected in some manner with individual cognitive agents, and together they may compose some sort of system. Multiple cognitive agents have, over time, brought the legal system to its current state, and certain specially-designated collections of individuals may change it at any moment. In fact, from a systems perspective, it is more likely the confluence of any current legal system and its subjects *together as a system* that are self-organizing and adapting. When we are seeking to explain, and perhaps even predict, the behavior of systems, we must articulate the processes of interaction. According to Gallagher, it is interaction "in the right way" that makes institutions constitutive of cognition—to make it part of one system, as it were. Our discussion of systems thus recommends a *right way* of interacting: It is a mutual dependence that, extended in time, leads to self-sustaining and self-organizing stabilities in cognitive performance. But, in order to have this core tenet in hand, we must ask: What are the mechanisms that sustain this? One major issue with Gallagher's proposal is that it does not yet include an account of these interactive mechanisms, which are the key ingredients to systems thinking.

Some recent examples of the extended-mind hypothesis applied to physical tools may be helpful in this discussion. Dotov, Nie, and Chemero (2010) investigated the use of a computer mouse as a physical extension of the cognitive system. To do so, they showed that the physical device itself, when coupled to the human system (via the hand), moved around in a way that exhibited a hallmark quantitative signature of cognitive dynamics. When the system was perturbed, this signature went away. In these experiments, the human system is continuously coupled with the physical device in a way that brings it into "cognitive proximity," that crucial mutual dependence between human and artifact. In related work, such as dynamic touch (for review see Turvey and Carello (2011), tools can be coupled to the human body in a manner that makes the tool itself, in a sense, an extension of the perceptual system (e.g., imagine feeling around a room with a stick, or judging the weight of an object at the end of a stick). As in Dotov et al. (2010), this process of dynamic touch unfolds as a specific kind of coordination between the human body and the physical tools. This work demonstrates that extended cognitive systems have specific coupling dynamics that can be identified empirically, at the level of physical interactions.

Can social institutions, writ large, exhibit this kind of coupling? Consider again a legal system, alongside the traditional locus of the cognitive system: a cognitive "agent" – one person's "skin bag" (Clark, 2004) and its contents. Is there a mutual dependence between the legal system and an *individual* cognitive agent in time? At first blush, the answer to this clearly seems to be "No." In "real cognitive time" one person is not influencing the legal system. Yet, it may be the case that, aggregately, the cognitive performances of thousands (if not millions) of people over time are what bring about the forces of legislative change. In fact, the very sustenance of a form of governance, or a social contract inscribed in common laws, suggests that we enact it as individuals all the time; thus, we are influencing it by maintaining its existence. In this sense there may be some *tiny* proportion of influence between *one* cognitive agent and the legal system. But this seems to be a small

basis on which to fold the legal system into the cognitive domain.[1]

While there may be an asymmetric balance of influence between legal systems and an individual cognitive agent, this is still a mutual influence, and perhaps it is the legal system's contribution to our performance that leads us to espouse its membership into the cognitive domain. Yet even here, when we *articulate the mechanisms* of mutual influence, it is in fact not the "legal system" with which an individual cognitive agent interacts. As we noted above, in most circumstances a cognitive agent interacts with other cognitive agents who know only some subset of the knowledge we call the "legal system." In fact, the legal system, at any given time, is only known partially by the cognitive agents who interact with each other in relevant situations. Thus, when focusing on the information flows from legal systems to individual cognitive performances, it is *via* other cognitive agents themselves. Even in the most obvious circumstances in which agents interact with the legal systems, the *cognitive mechanisms* are still a function of artifacts rendered by other cognitive agents (e.g., case briefs, courtroom proceedings, and legal advising). The legal system is the aggregate system of actions executed by agents with certain kinds of information flows between them, and such information flows consist of particular environments and technologies. We can put this a different way: at the *cognitive level of analysis*, there *is no legal system* with which we interact. This is why it probably sounds odd to say, when we await a green light, "I am interacting with a legal system."

But, surely, there is a "legal system." And Gallagher understands "legal-system interaction" to mean more than just "I am seeking a class action lawsuit against Company X." Gallagher's proposal suggests something deeper and more constitutive of cognition. The issue we wish to raise is that systems thinking invokes *levels*: "Systems can be nested within systems" (Meadows, 2008, p. 32). The legal system is composed of the activities of cognitive agents, and these activities are varied and complex. The problem is that this large host of varied activities are all nested inside the category we label "the legal system." These activities are not simply "the legal system"; they break down into more local and tangible systems (interactions that extended mind theorists have already attempted to explain).

So when Gallagher says that institutions can be mental when they interact with us in the right way, we must ask: *What is the right way?* The answer, it seems to us, comes in the form of identifying the local mechanisms that accomplish it. One can certainly say "The legal system is part of our cognitive system," but what is really meant is: "The legal system represents an aggregate of practices, and when we act within these practices, we consider ourselves to be operating within the legal system." This is a non-trivial observation if our aim is to improve our understanding of cognition. Without knowing the local mechanisms, we cannot know the nature of the socially-extended mind. By recognizing the importance of different levels of explanation, cognitive researchers can articulate how individual cognitive agents operate in the nexus of practices we refer to as the legal system; when these processes and mechanisms of interaction are in hand, we can gain a more complete understanding of what exactly it means for the social institution, emerging from such local practices, to be constitutive of cognition.

## 4. Conclusion

It has been recognized for some time that the broader social system must be considered when we investigate the behavior of individuals. To understand the decisions people make, and the cognitive processes they employ, we must understand the cultural institutions in which they operate (see Atran, Medin, & Ross, 2005 for review and discussion). A radical extension of this is Gallagher's second-wave extended, enactive mind. In this framework, we do not just speak of cultural contexts of cognition, but of cultural and institutional processes that are part and parcel of cognition. Whether extending cognition in this way is a fruitful manner of speaking comes down to the details: Does it help frame new questions, new modes of inquiry, and so on? Above, we argued that the term "mental institution," when elaborated mechanistically, may just refer to the contexts in which first-wave extended mind is operating. However, with further details, Gallagher's work may lead us in interesting new directions. We would like to temper these insights with a reminder that systems are incredibly complex, and must be addressed at the local levels where components concretely link up. Only after such work is done can we confidently claim that something as abstract as "the legal system" is constitutive of our daily cognitive capacities.

## References

Ashby, W. R. (1956). An introduction to cybernetics (Vol. 80). Taylor & Francis.

Atran, S., Medin, D. L., & Ross, N. O. (2005). The cultural mind: Environmental decision making and cultural modeling within and across populations. *Psychological Review, 112*(4), 744.

Clark, A. (2004). *Natural-born cyborgs: Minds, technologies, and the future of human intelligence*. USA: Oxford University Press.

Dotov, D., Nie, L., & Chemero, A. (2010). A demonstration of the transition from readiness-to-hand to unreadiness-to-hand. *PLoS ONE, 5*(3). http://dx.doi.org/10.1371/journal.pone.0009433, e9433.

Gallagher, S., & Crisafi, A. (2009). Mental institutions. *Topoi, 28*(1), 45–51.

[1] It is also possible for unidirectional influences to render system-like properties, such as when a dynamic system synchronizes to an external force. However, even here, we would argue that a system understanding comes from understanding the mechanisms of *interaction*. In fact, articulating the fundamental principles of such dynamic interaction has become an immense scientific agenda cutting across the sciences (Pikovsky, Rosenblum, & Kurths, 2003).

Gallagher, S. (2013). The socially extended mind. *Cognitive Systems Research*, *25–26*, 4–12.

Mead, M. (1968). Cybernetics of cybernetics. In H. von Foerster et al. (Eds.), *Purposive systems: Proceedings of the first annual symposium of the American Society for Cybernetics* (pp. 1–11). New York: Spartan Books.

Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.

Pikovsky, A., Rosenblum, M., & Kurths, J. (2003). Synchronization: A universal concept in nonlinear sciences (Vol. 12). Cambridge university press.

Ramage, M., & Shipp, K. (2009). *Systems thinkers*. Springer Verlag.

Tollefsen, D. P. (2006). From extended mind to collective mind. *Cognitive Systems Research, 7*(2–3), 140–150.

Turvey, M. T., & Carello, C. (2011). Obtaining information by dynamic (effortful) touching. *Philosophical Transactions of the Royal Society B: Biological Sciences, 366*(1581), 3123–3132.

Von Bertalanffy, L. et al. (1950). The theory of open systems in physics and biology. *Science*, *111*(2872), 23–29.

Wegner, D. M. (1987). Transactive memory: A contemporary analysis of the group mind. In G. Mullen & G. Goethals (Eds.), *Theories of group behavior* (pp. 185–208). New York: Spring-Verlag.

Wiener, N. (1948). *Cybernetics: Or control and communication in the animal and the machine*. Cambridge, MA: MIT Press.