



# Cultural sociology meets the cognitive wild: advantages of the distributed cognition framework for analyzing the intersection of culture and cognition

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## Abstract

Cognitive cultural sociology has exhibited a preference for the neuro-scientific wing of cognitive science that generally sees cognition as a process occurring in individual minds. This preference has contributed to the individualistic cast of cognitive cultural sociology. Other theoretical frameworks can help cognitive cultural sociology out of this pickle. The paper identifies the distributed cognition approach as a valuable theoretical framework capable of integrating many of the individual/neurological insights of cognitive cultural sociology with the more macro perspectives adopted by most cultural sociologists. The article describes the distributed cognition approach, emphasizing its affinity for some of the theoretical and analytical models already in use by a wide range of cultural sociologists. Features that it offers include a de-emphasis on the inside/outside boundary of the individual person as marking the limit of cognition, attention to heterogeneous networks of information and meaning propagation, and a strong role for culture not just in providing content for cognition but in actually shaping the distributed cognition process. The concept of distributed cognition has the potential to enhance, but not replace, the concept of culture by suggesting fruitful new avenues for exploring the pathways of information and meaning propagation that constitute cognition in its distributed form.

**Keywords** Distributed cognition · Cognitive neuroscience · Information and meaning · Culture and cognition · Public culture

The terms of trade matter in multi-disciplinary encounters. They deserve attention if we are to understand the import and impact of these entanglements in precincts near and far from the points of direct contact.

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A growing cadre of sociologists has articulated the positive potential of these terms in the encounter between cognitive science and cultural sociology. Zerubavel (1997) and DiMaggio (1997), for example, laid out early versions of the value of cognition as a framework for sociologists, and Cerulo (2002, 2010) has written extensively and convincingly about the importance and value of an engagement between cognitive science and cultural sociology, consistently describing a mutually, if asymmetrically, beneficial encounter, with cultural sociology gaining a more robust and scientifically valid understanding of human cognition that provides a necessary shot of microfoundational realism to anchor our explorations of constructed human cultural worlds. For its part, cultural sociology offers an understanding of the ways that cultural systems contextualize cognition more robust than that usually offered by cognitive scientists for whom culture and certainly cultural systems are often an afterthought.

In some respects, this sunny account of mutual benefit has come to pass. Our influence on cognitive science has always been more of an uphill prospect, though the offerings have been made. On the sociological side of the ledger, the encounter with cognitive science has ushered in something of a cognitive turn, or at least a robust cognitive option, for cultural sociological theory and analysis. Since the late 1990s (DiMaggio 1997; Zerubavel 1997), the culture and cognition research agenda has gathered significant momentum (Cerulo 2002, 2010; Martin 2010; Srivastava and Banaji 2011; Vaisey and Lizardo 2010; Lizardo 2007; Beyerlein and Vaisey 2013). Sociologists have asserted the centrality of cognition in the explanation of phenomena from sex to religion (Leschziner and Green 2013; Wuthnow 2007), with many stops in between, and in doing so have connected established and emergent bodies of research in the cognitive sciences to prominent empirical and theoretical debates in cultural sociology (Vaisey 2009; Vaisey and Lizardo 2010).

This research program has made especially important strides in identifying cognitive mechanisms that relate directly to some of our most basic ideas of what culture is and how it works. This literature, for instance, has produced the proposition that we should understand most of the cultural content of cognition to occur automatically, at a subconscious level, rather than deliberately, and furthermore that this is necessary because human brains are characterized by strong and stingy limits on how much information they can be aware of at any given moment. It has lent support and new focus to research into automatic, routinized sources of action reflected in habits, cultural schemas, and other rote activities through which we come to reproduce patterns of behavior and meaning without needing to deliberately process what we will do every time or what it means.

These findings are important, challenging our ideas about culture through their quite right insistence that cultural sociology must be cognitively realistic. But cultural sociologists should not, nonetheless, rush to adopt these and other findings about the nature, limits, and mechanisms of the human brain and cognitive system identified by cognitive scientists and adapted by cognitive sociology as the last word on the microfoundations of culture nor even as the last word on the potential contributions of cognitive science to cultural sociology. Despite the evident success of concepts derived from cognitive science in driving research in cultural sociology, and the empirical breadth of the inquiries they have lent themselves to,



the explanatory approach of cognitive cultural sociology is notably narrow: the individual brain and its functionality (or dysfunctionality) dominates the slate of mechanisms that cognitive cultural sociology has proposed for understanding the culture and cognition intersection, even when those mechanisms extend to the social consequences of that neuro-cognitive system.

Jerolmack and Khan have, in a similar vein, pushed back against the cognitive turn in cultural sociology, writing that “intuitively, culture as cognition makes a lot of sense. But, problematically, the cognition/toolkit approach explains and analyzes social processes strictly at the individual level; relationships are secondary” (Jerolmack and Khan 2014a, p. 188). They retreat from this position, however, (Jerolmack and Khan 2014b, p. 244) in response to a critique from Cerulo, who notes that not all studies with a cognitive toolkit theoretical framework ignore relationships (Cerulo 2014, pp. 222–223). Cerulo is certainly correct to robustly defend cognitive cultural sociology against the charge of ignoring relationships (see, e.g. Shepherd 2010; Paluck and Shepherd 2012; Srivastava and Banaji 2011; Vaisey and Lizardo 2010). But Jerolmack and Khan are too hasty in retreat. Cognitive cultural sociology doesn’t ignore relationships, but its *explanatory* quiver is loaded with mechanisms that operate at the individual level and skimpy on ways to integrate those with other levels of analysis. While cognitive cultural sociologists regularly claim to *not* be adopting inherently individualistic modes of analysis, the integration of the individual, cognitive explanatory mechanisms it has championed into the more macro, constructivist, interactionist, and systems perspectives in cultural sociology remains a work in progress.

This outcome may seem a self-evident consequence of the culture and cognition trade. Won’t a theoretical and empirical focus on cognition inevitably draw us toward more individualized models of culture in action and other culture-related processes? This article argues otherwise. Cognition, and even the incorporation of inherently individualistic neuro-cognitive mechanisms into cultural sociology does not necessarily require a schism between cognitive cultural sociology and other approaches to culture. But to better integrate cognition into cultural sociology we need to augment the bounty of neuro-scientifically derived concepts and mechanism that have been cognitive cultural sociology’s focus with theoretical frameworks that allow us to move between the brain and world. In doing so it is helpful to consider configurations of the culture/cognition intersection that go beyond those that are the focus of the cognitive neuroscience. In particular, in the hunt for theoretical integration it is helpful to relax the idea—rarely expressed in cultural sociological research but easy to slip into due to the mystery, smallness, and contemporary cultural appeal of cognitive neuroscience derived explanatory mechanisms—that the brain is the ultimate microfoundational unit for cultural analysis; it is likewise helpful to relax the related ideas that that cognition is what culture ultimately is, that the skull is a reasonable limit on the bounds of cognitive inquiry, and that the brain is the exclusive, or even a necessarily privileged, site of cognition.

There are a number of theoretical frameworks that may prove useful in better integrating cognitive and other branches of cultural sociology. In this paper, I will explore another potentially fruitful integrative framework that is a valuable alternative bridge between cognitive neuroscience and cultural sociology: the distributed



cognition approach. Distributed cognition expands the focus of cognitive science beyond the cognitive properties of individuals to focus on the “cognitive properties of... socio-cultural system[s]” (Hutchins 1995a, p. 362). In doing so it intersects many of the interests and concerns that inform the work of cultural sociologists, including the influence of culture on cognitive processes and an emphasis on representational systems that span heterogeneous networks of people and other media. Another of the founding contentions of distributed cognition is skepticism about taking the boundary of skin and skull as marking the limits of cognition. Indeed, one of the synergies that I will argue for below between cultural sociology and distributed cognition research comes from the blurring of this boundary through concepts—culture and cognition—that are distinctive in part because they occur in both individual forms and in the social world in ways that are irreducible to one another but are strongly intertwined, facilitating an approach that transcends the problem of individualism in favor of a focus on information processing architectures that transit both minds and social worlds through mechanisms specific to each. A number of sociologists have adopted distributed cognition concepts and analytical strategies (Zerubavel and Smith 2010; Mukerji 2009; Vaughan 1996). These instances, however, are dwarfed by the proliferation of sociological work of a neuro-cognitive bent. But they reflect an important neglected pathway for thinking about culture and cognition that is worthy of a second look as a way to navigate cultural sociology’s encounter with cognitive science.

To summarize the purposes of this article, then, I see two benefits to altering the terms of our trade with cognitive science to more deliberately incorporate distributed cognition. First, distributed cognition offers a slew of ideas and specific mechanisms of potential value to cultural sociologists. Second, as Cerulo has argued, engaging with cognition is important. It is one of the most influential contemporary popular and scientific frameworks for thinking about the social dimensions of human life, and sociologists should participate in forming it. But that engagement does not require accession to an exclusively neuro-scientific cognitive theory. Indeed, a resistance to the allure of individualizing theoretical imageries is one of the best things we can offer as an export to cognitive neuro-science and the temptation it offers of reducing the social to the workings of the brain. In that sense distributed cognition provides a sound and broad footing for furthering the engagement between cultural sociology and cognitive science.

### **Insides, outsides, upsides, downsides**

Cognitive science has grown up, as disciplines do, around founding dichotomies subject to less scrutiny than they ought to be. In particular it has been built around “traditional divisions between the inside/outside boundary of the individual and the culture/cognition distinction” (Rogers 1997, p. 2). Following this dichotomy, the individual person, indeed literally the epidermis (Magnus 2007, p. 300), becomes a salient boundary marker of the main subject matter for cognitive science. The brain, in this view, is the place where cognition happens—the main site of “cognitive



processes”—and the social world is but its contextualizing source material—the site of “cognitive content” (Hutchins 1995a, p. 353).

This formulation of cognition has a particular salience when imported into the context of cultural sociology because it aligns with pre-existing differences amongst cultural sociologists over how to think about and operationalize culture (Lizardo 2017). Generally speaking, one view focuses on culture as manifest in individual-level phenomena like mental states, emotional responses, articulable values, skills, opinions, and beliefs. The other position is essentially Geertzian, holding that “cultural acts are social events like any other; they are as public as marriage and as observable as agriculture” (Geertz 1973, p. 91). Most cultural sociologists, thankfully, see these more as complementary alternatives than as battle lines in a theoretical dispute (Lizardo 2017; Vaisey and Lizardo 2010, p. 1596). But we have been importing a vision of what cognition is and how it matters vis-à-vis culture aligned more closely with the former sense of culture.

The significance of this focus on the individual level of analysis depends on how far we think it flies as a theory of culture. On the “limited significance for cultural sociology” hand it represents an effort to understand the cognitive dimension of culture and to better account for the intersection of cognitive mechanisms with other cultural mechanisms, including mechanisms that are not reducible to individual-level cognition nor best specified at the individual level of analysis. It is also possible, however, to construct an expansive account of the significance of neuro-cognitive ideas for cultural sociology. From this perspective these developments reflect the quiet emergence of cognitive cultural sociology as the foremost account of the microfoundations of culture, underwritten by a layer of microfoundational mechanisms unassailably ensconced in the penumbra of neurological realism emerging from the physicality of the brain itself and thus appearing from the right vantage point more grounded, more “literal”, than mechanisms that operate at other levels of analysis. This second version of the cognition and culture argument, framed here at its tendentious limit, poses cognition as a real challenge to other ways of doing cultural sociology by posing the limits and characteristics of individual human cognition as a predicate that all other cultural sociological theories must jibe with lest they be accused of whiffing “an unseen, undertheorized, underspecified (and ultimately spurious) cultural ether.” (2010, p. 208). The most extreme version of this argument has the potential to transform the pre-existing divide in cultural sociological theory between individual and intersubjective understandings of culture into a vertical arrangement with the individual-level factors forming the more scientifically real, deeper layer of microfoundational mechanisms, and intersubjective, public manifestations transformed into culture’s amalgamated macro froth, a residual thrown up by an underlying neuro-cognitive reality.

Lizardo and Strand (2010), for example, use the cognitive limits concept in cognitive science to cast doubt on Alexander’s work on cultural structures. Apropos of one of the formative claims of Alexander and Smith’s strong program approach to cultural sociology, Strand and Lizardo write (*ibid*, p. 210): “The proponents of the ‘strong program’ in cultural sociology... make informal use of the woefully underspecified notion of ‘unconscious cultural structures’ which are somehow regularly structured and also regulate action... if something is ‘unconscious’ it is probably



not stored in a linguistic (or pseudo-linguistic) format—such as systems of arbitrary, disembodied, binary oppositions—and cannot easily be ‘re-described’ in this format (in the very same way that a baseball player cannot easily verbalize how it is that they can hit a 95 mph fastball).” This argument against a central premise of Alexander and Smith’s strong program, however, rests on the mistaken assumption that “cultural structures” must pertain to the individual (an assumption that Lizardo (2017, pp. 96, 111) later appears to relax). But by calling these cultural *structures* Alexander and Smith suggest that this assumption is misplaced. They are unconscious not because they are hidden in each and every mind, but because they are public, performed, and often institutionalized. Just like other social structures, cultural structures are patterns that are only fractionally contained inside of any one individual and only emerge identifiably as systems through the interconnected, coordinated, patterned circulation of representations, interpretations, performances, and other cultural media amongst multiple people and social environments (Norton 2019). As Malinowski put it, the Kula ring is made up of “so many doings and pursuits, carried on by savages [who] have no knowledge of the total outline of... their social structure” (1922, p. 83). None of us savages need know the whole of our social structures; we can be unconscious of them and yet they still exist because they extend, through specific and identifiable mechanisms, across multiple people and environments and thus elude the cognitive limits that a narrowly construed neuro-cognitive approach would hold them to. This, in any case, is a perspective that distributed cognition makes available and useful to cognitive and non-cognitive cultural sociology.

## Distributed cognition

Distributed cognition offers a fruitful alternative terrain for thinking about the relationship between culture and cognition by adopting an approach that theorizes cognition in a way that is better aligned with the Geertzian position described above on the intersubjectivity of cultural structures. It offers an alternative approach to cognition that does not take the physical limits of human beings and their brains as a definitive boundary in the analysis of cognitive systems, insisting that cognition is not necessarily or obviously best specified at the individual level. Distributed cognition researchers suggest instead that we understand the epidermis as a boundary in a cognitive system like any other, to be taken not as the edge of inquiry into cognition but as the edge of one mode and medium of information processing and storage and as a translation point to others with different properties. In this section I will review the basic principles of the distributed cognition approach.

Distributed cognition parts ways with cognitive neuroscience at a very basic theoretical question. The latter takes the individual mind and brain to be the site of cognition and thus the properties of individual cognitive systems, often best understood at the neurological level, are the centerpiece of their research. Distributed cognition similarly has cognition as its theoretical cornerstone, but rejects the premise that individual minds are the privileged site for observing and studying it, turning the most appropriate unit of cognitive analysis from a postulate to a centrally important



empirical question. The justification for this consequential theoretical departure is the concern that doctrinaire handling of the question of units of analysis violates the ecological premise: “not to put delimiting lines where they cut important information circuits” (Hutchins 2010, p. 706). Limiting cognition to the individual, in this view, cuts the circuits that actually constitute important types and instances of socio-cultural cognition. This initial difference leads distributed cognition research into significantly different ways of thinking about cognition, doing research into it, and generating questions about it.

This very basic parting of the ways begs the question of what cognition really means, and whether these two schools of thought are not just using the same word for fundamentally different things. They are not, and to reconstruct their common ground one must begin with the concept common to both schools of thought that cognition is a form of information processing. From a cognitive neuro-scientific view, cognition is roughly how human organisms process information (with a focus on the brain). This approach has been the most influential in the culture and cognition research of the last decade in sociology with its central focus on how the information processing properties of individual minds and brains shape culture and thus its consequences for sociological explanation.

Distributed cognition researchers, however, provide a quite different definition that encompasses the neuro-cognitive one just described and goes well beyond it. According to Hutchins cognition involves “the propagation of representational state[s] across media within a functional system” (Hutchins 1995a, p. 373; Rogers 1997, p. 2), a concept of cognition agnostic on where we should expect to see such systems, their limits, or how best to analyze them. This leaves distributed cognition with a wider analytical scope that includes individual cognition and also extends beyond it. For the purposes of enhancing the trade between cultural sociology and distributed cognition, we could adapt this definition further. The “functional system” part is important because it specifies the task-centered nature of cognition, limiting the concept so that all information processing does not qualify and preventing the unhelpful conflation of culture and cognition—they can be intimately related but are not the same. But for cultural sociological purposes it is helpful to draw out the connection between distributed cognition and meaning. In this light, cognition is the extraction of significance from the noisy informational barrage that the world generates. Cognition, that is to say, is the translation of information into meaning in a functionally oriented system. And put thus it seems clear that we are just as wise to look to socio-cultural systems as to individual minds to find cognition—and culture—in action.

This wider definitional canvas has been important in the development of the distinctive analytical focus of distributed cognition research on systems where cognition is distributed in heterogeneous networks, often including multiple individuals and the diverse systems that they use for processing that information. The properties of these distributed information processing (and meaning generating) systems have been a principal focus for distributed cognition research.

Before describing those properties, we should develop further the idea of what a “distributed” cognition system—the propagation of representational states across media within a functional system—looks like. A tough multiplication problem gives





a helpful example of what is meant by “distributed” cognition in its most basic sense (Magnus 2007, p. 299). For instance:

$$\begin{array}{r} 639 \\ \times 453 \\ \hline \end{array}$$

Reader, you are likely itching for your pencil—the cognitive burden of doing the problem in one’s head is too high for most. If you were to follow through on that urge, then you would still be processing information in a way that was driven by neuro-cognitive processes and schemas learned, perhaps, many years ago. But those neuro-cognitive processes would be stored and combined using a system—pencil and paper—that is clearly not made up of neurons or their impulses and that does not share their limits, strengths, or other properties—it has its own. The solution to the problem (spoiler: 289,467), the cognitive task or function, can thus be represented as the product of an individual neuro-cognitive effort supported, or “scaffolded,” as cognitive cultural sociologists sometimes put it (Lizardo and Strand 2010; Leschziner and Green 2013, pp. 137–138), by some paper and a pencil. But a distributed cognition perspective would prefer to describe the solution to this task as involving a distributed cognitive system involving different media—brains and paper—with different properties—the ability to calculate, the ability to store accessible representations of information and thus partial calculations indefinitely—linked by interface mechanisms—neuro-muscular control, the properties of a pencil that allow it to be manipulated by hands and leave marks on paper—and by principles of coordination that define the character of the interoperability of these systems—the interoperability between the calculating center and the storage center achieved through the numeracy skills of the calculating center (the person) and the properties of the storage medium (the paper) to hold written representations of numbers in readable ways (the relationship between the two).

For such a simple example either of these approaches, distributed cognition or scaffolded individual cognition, works fine. Similarly, actor network theory (Latour 1996) could also provide a theoretical framework for describing what is happening when we do math on paper, putting its emphasis on other aspects of the problem, perhaps suggested by its ontological agnosticism on the “actants” and transmissions that constitute a network. But, however, one looks at it, the properties of both media matter to the way that the system functions and the ways it can develop or go awry. And all of these and other possible approaches point to quite different research objectives and concerns. Scaffolded cognition, for example, focuses on the analysis of our minds as cognitive systems that have important limits, albeit limits that can be overcome to some extent by non-cognitive supports such as pencil and paper. Distributed cognition, on the other hand, leads us to the mapping and analysis of complex, heterogeneous cognitive systems. These differences, and the benefits of the distributed cognition approach as a way to bridge the theoretical gaps between cognitive and non-cognitive cultural sociology, become marked if we consider more complex distributed systems.

Edwin Hutchins, the founder of the distributed cognition approach, provides a good example of its application to a more complex context in his seminal book, *Cognition in the Wild*, drawn from his ethnographic work on a naval vessel. In





the book, he examines the navigation team as his unit of analysis, their cognitive task defined as navigating a ship from one point to another. In fine detail Hutchins describes the work of the navigation team, focusing on how their physical environment, including the tools that they use to do their task, the organization of the navigation team and its interaction dynamics, including factors like rank that shape “who they talk to and how they talk to one another” (1995a, p. xv), and the system of shared symbols that the team uses to communicate and coordinate their interactions, all contribute to the performance of a cognitive task that would totally outstrip the capacities of any individual. To highlight the specificity of information processing involved in the distributed response to the task of navigation on a US naval ship in the 1980s, Hutchins compares this system to that of Micronesian navigators, illustrating how these two responses to the identical cognitive task of maneuvering a vessel from one point to another constitute fundamentally different cognitive systems instantiated in different modes of representation, patterns of interaction, and uses of technology (ANT also seems well suited to analyzing this example, though its agnosticism on what is transmitted and which actants should be our focus complicate rather than facilitate the integration of neuro-scientific approaches to cognition with cultural sociology by casting doubt on the shared focus of these approaches on information). In short, what Hutchins shows is that these navigation systems are cognitive, distributed, and cultural phenomena.

It is tempting at this point to try to square the circle, perhaps equating distributed cognition with more attention to the broader social context of cognition (Smith and Semin 2007, p. 133), including culture, and in doing so to leave the underlying premises of neuro-scientific approaches to cognition intact. But this approach misunderstands how significantly distributed cognition departs from the basic assumptions of neuro-cognitive approaches. What Hutchins’ work shows most clearly is how the purported inside/outside boundary demarcating cognition from that which scaffolds or supports cognition, is attenuated to the point that it becomes unhelpful by the constant movement of information between people and other centers of storage and calculation. The distributed cognition approach suggests that intra-cranial information processing is just one system-architecture for cognitive information processing. It argues that though neural cognition is a very important and significant cognitive system to understand, there are many other important cognitive systems and an even larger number of hybrids. Hutchins puts the central motivation and justification for adopting a distributed cognition perspective in this way: “the cognitive properties of such distributed systems can differ radically from the cognitive properties of the individuals who inhabit them” (1995b, p. 265). Rather than seeing distributed cognition as attention to the social context of cognition (which still really happens in the brain) or the ways that our brains process social cues and information (social cognition), we should see it as a set of general cognitive principles that are unit and platform agnostic (while, in contrast to the deeper agnosticism of ANT, seeing the circulation of information and meaning as definitive of a *cognitive* system). That is to say, distributed cognition describes the challenges to cognition as a general problem, distinct from specific manifestations and therefore specified units



of analysis, instead aiming to describe general principles that characterize all cognitive systems, neural and distributed.

We can distill those principles to five central points. The first is that any system that engages in the functional transformation of information into meaning, that is, it engages in task-focused information processing, can be defined as a cognitive system. What this means is that depending on how widely we cast our analytical nets we may be dealing with multiple possibilities for specifying the contours, limits, and architecture of cognition. This includes the individual brain, which itself distributes cognition amongst a multitude of neurons and purpose specific sub-systems, neural, emotional, and corporeal (Minsky 1986) as well as more heterogeneous and extensive distributed cognitive systems potentially combining multiple people, other organisms, representational or symbolic systems, and the physical world.

The second principle is that different cognitive systems can potentially have radically different information processing architectures and possibilities. This includes the properties and capacities of elements within the system, such as their storage capacity and format or their capacity to manipulate information and their connections and capacity for communication with other system elements. The analytical challenge for cognition research is to examine and understand these architectures, with neuro-cognitive research providing an exemplary effort to do this for one architecture of special importance: the neuro-cognitive system. This is but an example, though, as there is an endless variety of other information processing architectures.

The third principle is that given this stark diversity in cognitive properties, it is of great value in any cognitive system to define how information—often understood in the distributed cognition literature as representational states, a useful overlap with semiotic approaches to cultural sociological analysis—moves and propagates through the system. This involves both attending to the pathways that representations follow as well as the mechanisms that actuate and mediate their movement.

The fourth principle, closely related to the third, is that the movement of information through cognitive systems necessarily involves the translation of representational states. That is to say representations are medium specific and do not move as entities with certain properties retained as they move across different cognitive units and relationships. The propagation of representations across a functional system entails regular translation, and thus a profusion of representations within the system. This issue is not always of equal importance. Nodes that operate on the same principles may exchange information in a close to exact way. Its salience rises, however, when crossing broad representational gaps as in the literal case of translating between human languages or between a mathematical representational system and a linguistic one, or between non-humans and humans.

The fifth principle is coordination. Cognitive systems, if they are to be capable of being understood as task-focused in any meaningful way involve coordination between the different nodes in the system and the information flows between them. Otherwise, we would likely not define it as a system that processed information so much as one that was informationally noisy. The analysis of cognitive systems always necessarily involves attention to how information processing is coordinated within that system in ways that enable the system to achieve its cognitive task—or in terms more common to cultural sociology, to grasp the meaning of something.



These principles apply just as much to describing the cognitive challenges faced by individual brains and minds as they do to systems like that enabling complex navigation. Uncoordinated information circulation describes chaos on a ship just as much as it does a neuro-cognitive pathology.

This way of thinking about cognition offers important openings to cultural sociologists in at least three ways: (1) it identifies a prominent role for culture in human cognition that is distinct from its significance for mental cognition; (2) it allows for a more broad based and multi-directional conversation between cultural sociology and cognitive science; and (3) it reinforces the importance of identifying concrete mechanisms for integrating cognition with cultural sociology of all stripes. I will briefly discuss these benefits in the following three sections.

### **Culture in the distributed cognition literature**

Culture plays a fundamentally different, and more centrally important role in distributed cognition systems than it does in individual cognition, opening important new avenues for understanding the links between culture and cognition. Generally speaking, neuro-scientific approaches to cognition, including the sociological work that draws on this school of thought, see culture as layered atop the primal cognitive architecture of the human mind. Culture is not taken to influence the process of cognition in most circumstances, having to do more with the content of cognition than its form (Hutchins 1995a, p. 353). Martin (2011), for example, has argued strenuously against theoretical positions along the lines of the Sapir-Whorf hypothesis suggesting that culture works as a kind of filter or “grid of perception” that influences perception and cognition. He instead insists on the primacy of perception and the post hoc interpellation of culture into what we make of what we perceive. But in distributed cognition systems, culture can play a centrally influential role in the cognitive process. Indeed, we can say that culture in distributed cognition is constitutive of the cognitive architecture of the system, central to cognition rather than layered on top of or subject to it. As Hutchins writes, “high-level cognitive outcomes emerge from the orchestration of the elements of distributed cognitive systems by cultural practices” (Hutchins 2008, p. 2011). Unlike individual-level cognition, in distributed cognition culture powerfully influences the movement of information through the system. It defines system elements and their relationships, provides the symbolic context against and through which “actants” (Latour 1996, p. 373) in the system transmit representations, and also contributes to establishing the system of relations within which the distributed cognition system can be understood as functional.

Culture plays such a constitutive role in distributed cognitive systems because it is the concept that best captures the related cluster of mechanisms and structures through which human groups define situations, link them to other situations and create both immediate and more durable collective interpretations and possibilities for meaning making. That is to say, culture plays a central role in intersubjective coordination, and coordination is central to all cognition, whether mental or distributed. Regardless of whether it deeply penetrates the workings of individual minds, culture—and importantly, the specific content of cultural systems—does deeply



penetrate the workings of human relationships and situations, giving it a powerful influence over the character of cognitive systems that transcend the boundaries of the brain and body to incorporate multiple actors, artifacts, processes, and symbols that must be coordinated to form operable information processing systems. It is in this sense that Geertz writes, “man is precisely the animal most desperately dependent upon such extra-genetic, outside-the-skin control mechanisms, such cultural programs, for ordering his behavior” (Geertz 1977, p. 44). It is because it is so important to intersubjective coordination and communication that culture plays a central role in determining how distributed cognition systems work and not just what they work on.

For example, we can think of culture’s coordinating role in episodes like a trial (Norton 2014). Trials are a good example of a distributed cognition system, circumscribed by the cognitive task of determining guilt and innocence which is achieved through the coordinated propagation of representations across the various media of the trial, from law books to judges, attorneys, bailiffs, the accused, precedents, scheduling systems at the court house, and on and on. The cultural infrastructure of a trial is central to its operation because it establishes the key principles, symbols, roles, schemas, scripts, and contexts that allow the intricate, interactive situations through which the trial achieves its cognitive task to cohere into coordinated, legible aspects of a collective meaning-making process. And the successful functioning of the trial as a vehicle of meaning-making depends intimately on these coordinating elements. The cultural infrastructure of the trial, for instance, assigns tightly proscribed roles, associated with certain powers, responsibilities, and information flows. It prescribes the sequence of events that will take place. It sets conditions on who can speak, when, and in what manner, all to form, regulate, and empower its apotheosis, the performative determination of guilt or innocence. The centrally important role of these cultural aspects of the law become even clearer if we consider, for instance, periods of legal change where essentially identical cognitive agents face essentially identical situations, but with drastically different legal outcomes because the cultural infrastructure of the situation has been transformed. The cognitive process, that is to say, depends directly on the content and structure of the cultural system that forms and binds it into a coherent site that transforms information into social meaning.

## **In defense of a broad-based cognitive sociology**

The previous sections have described the distributed cognition research program as a potentially fruitful way to build on the cognitive turn by better integrating it with other ways of doing cultural sociology and for adding depth and resonance to cognition as a sociological concept.

There are, however, arguments against this approach, and these counter-arguments come from both sides. On the one hand, some argue against the cognitive turn in general, associating it with methodological individualism and the scientific reduction of the complexity of human social relationships in a capitulation to what Satel and Lilienfeld call “the seductive appeal of mindless neuroscience” (2013). On



the other hand, those committed to a neuro-scientific concept of cognition can, and indeed have, argued that distributed cognition foregoes mechanisms and the very realism that makes cognitive science a powerful source of ideas and inspiration for sociology in favor of an amorphously described theoretical imagery that takes as its point the elision of the boundaries between the individual and the world that make the cognitive science enterprise possible and valuable. In this section, I respond to the first of these objections, in the next to the second.

Button, in an article titled “Against ‘Distributed Cognition’” (2008), rejects distributed cognition as a point of convergence between social and cognitive science. His premise, following Suchman (1987), is that “the very idea of cognition is itself a mistake” and that cognitive science is a repository of “mistaken ideas about mind and meaning” (Button 2008, pp. 88–89). The central mistake of a cognitive way of looking at things, according to Button, is that it adopts a theoretical framework that pushes a strong dichotomy between the individual and their social context. But where I have described distributed cognition’s response to this founding dichotomy in a positive way above, Button sees things differently. He makes two main arguments against distributed cognition. First, he sees distributed cognition as engaged in an effort to “[describe] social phenomena in a redundant cognitive vocabulary” (Button 2008, p. 89). In doing so it acts as a sort of bridgehead for the unwarranted expansion of cognition-speak. Furthermore, Button argues that distributed cognition replicates the same errors that he attributes to cognitive science in general. Distributed cognition, he writes, “should be dismissed for the very same reasons that cognitive science should be dismissed: because it argues the plausibility of the dichotomy between an inner and outer world” (Button 2008, p. 89).

But Button’s description of distributed cognition as adopting the same dichotomy between inside and outside that defines the neuro-cognitive approach in cognitive science misunderstands the relationship of distributed cognition to this dichotomy. Distributed cognition does not accept the inside/outside boundary and take as its subject matter what is on the outside. Rather, distributed cognition challenges inside/outside as a foundational way to organize cognitive scientific inquiry, instead treating it as merely a potentially empirically salient boundary within the field of cognition. In distributed cognition research the recognition that individual minds are indeed distinct in the way that they process information does not prop up a dichotomous treatment of mind and world but rather reflects an attention to general elements of all cognition systems, neural or distributed, and to how distinct information processing architectures afford the forms and flows of information and meaning through potentially heterogeneous systems. This imagery, of movement and interconnection within a dynamic representational system, is of particular interest to cultural sociologists who focus on cultural structures and systems in the social world but are cognizant and concerned that their macro theoretical formulations are plausible, even if not best specified, at the individual level.

Button’s other objection amounts to questioning the purpose of distributed cognition. If the point of thinking about the social world in this way is simply to recast it in a redundant cognitive vocabulary, then that hardly seems worth the effort. It is indeed the case that there are other theoretical imageries available for describing the systems that are distributed cognition’s focus: scaffolded cognition, actor networks,



the relationship between personal and public culture (Lizardo 2017), and approaches to cultural sociology focused on materiality (McDonnell 2014) for instance. Among these approaches, the reasons for focusing on or including a distributed cognition approach has to do with analytic focus. But when Button writes that “‘Distributed Cognition’ then, views the cultural world and the activities and interactions between people that make it up as ‘cognitive systems’” (Button 2008, p. 89), he overstates the matter. Contrary to this reading, in a distributed cognition approach, culture is not cognition and all cultural research is not research into the cognitive properties of cultural systems or individuals; distributed cognition is not a general-purpose social or cultural theory. Rather, it focuses on one specific feature of social and cultural systems: information and the causal significance of how its circulation is structured and formed, stored, translated, and made manifest in action and other media. Rather than a pointless exercise in re-describing social and cultural phenomena in a redundant cognitive vocabulary, I would characterize distributed cognition as an advantageously narrow conceptual offering. Distributed cognition focuses on a very particular process and a very particular arrangement of a socio-cultural system that exhibits certain properties in the face of specific challenges. Distributed cognition researchers get at this specificity by insisting that one of the defining features of a distributed cognition system is that in addition to being cognitive (directly involved in the transformation of information into meaning) it must have a task that the researcher can identify and use to understand the propagation of representations through the system. As Magnus writes, “a system can only be given a [distributed cognition] description if it is thought of as performing a function” (2007, p. 297), ensuring a clear limit and purpose for the concept. A construct like Alexander and Smith’s “discourse of American civil society” does not, for instance, fit this description because it is not defined by a clear task. As a whole it is better understood simply as a cultural system, all or parts of which may be incorporated into a specific information processing network that we define, through the observation of a specific function and discernable pattern of information propagation and meaning-making associated with that function, to be a distributed cognition system. The point is that just as cognitive cultural sociology influenced by neuro-scientific approaches does not see cognition as a replacement for all of cultural or social analysis, neither do distributed cognition researchers. Rather, they see cognitive systems as specific empirical contexts that demand attention to the properties and processes described above.

## **Literalism and distributed cognition**

On the opposite flank from Button is the argument against distributed cognition from a neuro-cognitive perspective. It reflects the idea that distributed cognition research is not really talking about the same thing as cognition at the level of individual minds. Distributed cognition uses cognition in a metaphoric way, this argument goes, that should not be confused with the physical, scientifically ascertainable realism of a process that occurs in flesh and blood individuals. Lizardo and Strand’s rejection of distributed cognition runs along these lines. Distributed cognition theorists, they write, “obfuscate [the character of cognition] by making equivocal



statements about the *location* of cognitive processes. We share Bloch's 'literal mindedness' in noting that cognitive processes must have a concrete location and cannot float around unmoored outside of the person's skin" (Lizardo and Strand 2010, p. 209). But the charge that distributed cognition posits this sort of unmoored, metaphorical vision of cognition does not reflect the thrust of this literature. Indeed, one of the central objectives of distributed cognition research is to carefully analyze precisely how cognition can be moored in literal, empirically observable, analytically specifiable, coordinated networks that extend from people's brains into their social and physical environment, into the brains of others, and back. It is a study predicated on the detailed accounting of information flows and the translations entailed by different media, each with knowable and important information processing and storage properties, just as individual minds have such properties as revealed by cognitive neuro-science. The thrust of the literature is to be as literal and specific as possible about the relationships, pathways, media, representations, processes, and dynamics that constitute distributed cognitive systems by tracing them to the extent possible at the level of information and meanings, the basic units of distributed cognition systems.

We can take this point further to say that the distributed cognition approach plays a valuable theoretical role by highlighting the risk entailed by treating the individual as the boundary of "literal mindedness" and in doing so obscuring the many circuits of information that cross it. Distributed cognition theory rejects an approach to thinking about mechanisms that insists that a search for mechanisms is always a search for smaller units of analysis. Go too small and some phenomena are wont to disappear. Distributed cognition, for example, adopts an approach to mechanis- mal explanation of distributed cognitive processes focused more on enchainment (Abbott 2001, p. 445) than on microfoundations. If the microfoundational approach to mechanisms always wants to find the smallest unit of analysis, the enchainment approach focuses more on how different identifiable causes, whatever their level, are associated with one another, tied or chained into "reactive sequences" (Mahoney 2000), structurally determined or contingent, that lead to the outcomes of interest. From this perspective, the identification of mechanisms relies not on smallness but on their contribution to our analytical capacity to capture the circuits of interest and render from them causal significance and adequate explanations. By focusing on information processing, and specifically on the transformation of information into meaning, distributed cognition provides a platform that encourages this sort of multi-level causal account, lending itself to a model of cultural mechanisms that does not associate literalism with individualism, but rather with how different sites of information storage and processing are enchainment and the reactive sequences that define information processing in the empirical contexts of interest. In short, with the transformation of information into meaning in functional systems, which is to say, cognition.

Because of its easy incorporation of a wide variety of mechanisms occurring at different levels of analysis into processual analyses of the circulation of information in social systems, distributed cognition theory can play a valuable role in specifying more general theories of culture. For example, Lizardo (2017) describes the relationship between three modalities of culture, culture as public, as personal and





linguistically accessible, and as personal and non-linguistic, embedded in things like habits, skills, and emotional responses. This theoretical framework is helpful in differentiating these often confused modalities of culture and in identifying some of their central characteristics. It is also helpful in its identification of the importance of relating them to one another. Far from exhausting issues about the relationship between culture at the level of the individual and the social environment, however, this theoretical framework identifies the further specification of the varied pathways connecting these elements as a pressing task of contemporary cultural theory. As Lizardo writes, “a key line of future work is to begin to theorize how dynamic enculturation, cultural activation, and cultural use processes link with dispositional, relational, and institutional/environmental mechanisms across settings to generate important phenomena of both theoretical and practical interest” (2017, p. 110). Distributed cognition offers a robust option for such specification by providing a focused theoretical and analytical perspective that is easily able to move between declarative, non-declarative, and public modalities of culture and in which the different characteristics of these cultural modalities can be readily integrated into empirical analyses and theoretical models of distributed, heterogeneous information processing and meaning-making architectures.

## Conclusion

The idea that the most important mechanisms for describing cognition and its intersection with culture will be best specified at a unit of analysis conveniently demarcated by the epidermis of humans is not an obvious or unassailable truth. To be sure, it is a powerful and alluring idea in part because of its self-evident neuro-scientific literalism, its promise to locate culture, renowned for its ambiguity, in the stability of something real: our neurons and their connections, the properties and limits of our brains. But we shouldn't rush to the adoption of a vertical microfoundational picture with our brains at the bottom, their properties taken as constraints on higher level, more complex manifestations and mechanisms of culture. While some aspects of this model will certainly be crucial to understanding the intersection of culture and cognition, we also need to make space for more complex dynamics and mechanisms occurring at different levels of analysis. In doing so we can better integrate culture and cognition. Cerulo has argued that sociology must engage seriously with cognitive science (Cerulo 2010). A new focus on the rich trading opportunities represented by the distributed cognition literature may well open the necessary space for a greater range of cultural sociologists to engage, together, in thinking about what to make of the intersection between culture and cognition.

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