Anthropology in Cognitive Science

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Abstract

This paper reviews the uneven history of the relationship between Anthropology and Cognitive Science over the past 30 years, from its promising beginnings, followed by a period of disaffection, on up to the current context, which may lay the groundwork for reconsidering what Anthropology and (the rest of) Cognitive Science have to offer each other. We think that this history has important lessons to teach and has implications for contemporary efforts to restore Anthropology to its proper place within Cognitive Science. The recent upsurge of interest in the ways that thought may shape and be shaped by action, gesture, cultural experience, and language sets the stage for, but so far has not fully accomplished, the inclusion of Anthropology as an equal partner.

Keywords: Anthropology; Culture; Field studies

1. A promising beginning

In some respects Cognitive Science was most successful at the very moment it was born. It is difficult to recapture the excitement of the first Cognitive Science Society meeting, but it was palpable. Each of the subdisciplines associated with cognitive science was well represented. It was like going to an exotic marketplace and sampling an intriguing variety of wares. That there was not a common language only added to the interest and desire for commerce.

Our purpose is to write about the status of anthropology within cognitive science. Given anthropology's perpetual interest in cultural knowledge and meaning, a productive collaboration between cognitive science and anthropology would seem to be natural. One of the most influential early definitions of culture was ''that complex whole which includes

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knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society'' (Tylor, 1871, p. 1). Although this definition is wide ranging, these are just the sorts of intelligent actions that cognitive science aims to address. One way to narrow the scope of culture as defined above is to focus on the complex networks of meanings that are both the products of thinking and provide the contexts for thinking (Geertz, 1973). Anthropologists know that cultural meanings are not chaotic or random, but rather form complex patterns. Much of anthropology has been dedicated to working out the principles of the organization of systems of meaning. Taken at face value, that sounds like a project that would be of great interest to cognitive science.

In North America in the early part of the 20th century, many departments of anthropology organized themselves around four subfields: archaeology, biological, linguistic, and socio-cultural anthropology. It was hoped that these subfields would inform one another and from them would come a more complete understanding of the human species. At least initially, anthropology was conceived as a beautiful marriage of humanist and scientific approaches.

By the 1950s, presaging the cognitive revolution, the subfield of cognitive anthropology emerged out of a blend of linguistic and sociocultural anthropology. Culture would be ''whatever it is one has to know or believe in order to operate in a manner acceptable to its members, and do so in any role that they accept for any one of themselves'' (Goodenough, 1957, p. 167). This definition puts culture in the head rather than in the world. It made the social and material worlds into things that people think about, but not things that people think with.

Exploring the organization of knowledge in a variety of subject matter domains across a range of societies, cognitive anthropology blossomed in the 1960s and 1970s. In parallel the cognitive revolution took hold in psychology and linguistics and laid the groundwork for the development of an interdisciplinary cognitive science. The definition of culture as what people know was very congenial to the interest in knowledge and representation in other areas of cognitive science.

Around the time when the Cognitive Science Society was formed, Roy D'Andrade (1981) suggested a convenient division of labor, whereby psychology would study *how* people think and cognitive anthropology would study *what* people think. Cognitive anthropology moved in step with other areas of cognitive science, exploring various theories of representation of meaning—roughly in order: features, prototypes, fuzzy categories, schemas, and mental (cultural) models—and the exchange involved a two-way traffic in ideas.

One notable achievement was the development of a variety of formal and computational methods for analyzing knowledge and knowledge representations. This often involved collaborations between anthropologists and psychologists, as for example in the development and application of multidimensional scaling (e.g., Shepard, Romney, & Nerlove, 1972) and cultural consensus modeling. Consensus theory (Romney, Weller, & Batchelder, 1986) provided a computational rationale for addressing questions such as how many informants must an ethnographer sample in order to be comfortable saying that a particular view is representative of a culture (Boster, 1985) or how to decide when there are one or more coherent subgroups in a given sample (e.g., Medin, Lynch, Coley, & Atran, 1997). Other

cognitive anthropologists sought to model cultural processes as emergent properties of systems of interacting agents (Hutchins & Hazlehurst, 1991, 2002; Kronenfeld & Kaus, 1993).

There were also important empirical achievements. Work in the allied area of anthropology, known as ethnobiology (studying people's relationships with plants and animals) suggested that there were universal principles for perceiving, classifying, and naming biological kinds (Berlin, Breedlove, & Raven, 1973). Eleanor Rosch (Rosch, 1973; Rosch & Mervis, 1975; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976) built on these observation to develop the notion of ''basic level'' categories and the idea of goodness of example or typicality effects (see also Berlin, 1992; Smith, Shoben, & Rips, 1974)—ideas that reverberated throughout the cognitive sciences (Smith & Medin, 1981; for a modern treatment see Murphy, 2002).

Another interdisciplinary achievement of the early era was the working out of the story of color cognition, spanning insights from neurochemistry through perceptual psychology to patterns of language and culture (Berlin & Kay, 1969; Rosch, 1973; see also Hardin & Maffi, 1997). In those years, the primary points of contact between anthropology and cognitive science were through cognitive and linguistic anthropology (for an overview, see also D'Andrade, 1995).

2. Alienation

In the intervening years, many things changed. Possibly the most important event in anthropology in the past three decades is the divorce of the scientific and the humanist branches. In many departments of anthropology, a rift opened between the scientific subfields (biological/physical and archaeology) and the humanist subfields (sociocultural and psychological).[1] Although cognitive anthropology strove for objectivity, its questions, theories, and methods had little in common with the other scientific subfields of anthropology. While cognitive anthropology insisted on its dedication to understanding human experience, it was much too positivist for the tastes of the humanist subfields, where postmodernism was carrying the day. Put in simple terms, whereas positivism insists on argument by empirically verifiable observations as the only valid basis for knowledge, postmodernism claims that observations are necessarily subjective, and that truth is created rather than discovered. As a consequence, sociocultural anthropology pulled away from all things scientific—except the humanistic study of the practice of science. In short, in the divorce, cognitive anthropology was the unloved child and neither parent wanted custody.

This development should have pushed cognitive anthropology straight into the arms of cognitive science. And early on there were signs that this was happening. For example, when the rigidity of traditional symbolic representations became a burden, cognitive anthropologists borrowed the language, if not the formalisms, of connectionism to describe malleable cultural knowledge (Strauss & Quinn, 1997). But somehow the content/process division of labor between anthropology and the rest of cognitive science became a barrier that isolated anthropology.

It is one thing to suggest that anthropology and cognitive science had a good first date; it is quite another to determine why the relationship did not progress further. We think that

some plausible guesses can be made by contrasting anthropology with cognitive psychology. One hypothesis is that what appeared to be complementary perspectives at a distance turned out to be nearly incompatible orientations when examined more closely. Anthropologists may be turned off by cognitive psychology's devotion to studying undergraduates in highly artificial lab situations that prize tightly controlled design over realistic contexts and real-world relevance. Cognitive psychologists, by way of contrast, may perceive anthropology as lacking in experimental rigor, tending to make claims without presenting the data that support them and as so oriented towards qualitative data that it is difficult to distinguish it from story-telling (the fact that postmodernists claim that this is exactly what cultural anthropology is does not help). According to James Boster (in press) cognitive anthropology differs from cognitive psychology in that the former focuses on content (not process), communities and social contexts (not individuals), natural settings (not labs), capturing real-world phenomena, even if it requires some relaxation of rigor, and worries about whether data collected actually mean what they may seem to mean on first glance.

Consider an interesting speculation offered by one reviewer of this manuscript. Suppose that anthropologists had dominated the editorial system of the journal *Cognitive Science* in just the way that cognitive psychologists have. And suppose that instead of having experimental rigor as the deciding criterion authors had to demonstrate that their findings extended beyond laboratory studies with undergraduates to real-world contexts. How would that have affected the type of studies and the kind of results published? Perhaps it is time to reconsider whether there are biases in our system that favor some disciplines over others, and whether that in itself could be an important source of alienation.

Another possible factor in the schism arises from the fact that anthropology traditionally has followed something of a ''lone ranger'' model for research and graduate training. Graduate students rarely study the same populations or focus on the same theoretical questions as their graduate advisors. Consequently, anthropologists may be less inclined to engage in collaborative research with other cognitive scientists, and when they do, they may be handicapped by not having graduate students who can grease the interchanges between crusty old senior researchers.

In any event the promising beginning of anthropology within cognitive science has neither developed nor persisted across time. In the remainder of our review we argue that the grounds for anthropology being a key player in cognitive science are stronger than ever and then turn to some projections for the future.

3. The case for a rapprochement

We do not think that the indifferent relation between anthropology and the rest of cognitive science makes intellectual sense. First of all, the content-process distinction that justified the proposed division of labor between cognitive anthropology and cognitive psychology did not hold up to closer scrutiny. Research by people like Michael Cole (1996), Edwin Hutchins (1995, 2005, 2006; Alac & Hutchins, 2004), and Donald Norman (1993; Zhang & Norman, 1995) indicated that the social and material world participates in the

organization of cognitive processes. For example, one cannot ask about the development of children's autobiographical memory in isolation because that depends on parental speech to children, which varies substantially across cultures (Miller, Cho, & Bracey, 2005; Wang, 2006, 2007). Even theory of mind development depends on social context and varies across cultures (Liu, Wellman, Tardif, & Sabbagh, 2008; Lu, Su, & Wang, 2008; Tardif, Wellman, & Cheung, 2004; Wellman, 2002). Some neuroscientists now believe that the very architecture of the adult brain is affected by the organization of lifelong experience (Quartz & Sejnowski, 2002).

The concession that culture affects not only *what* people think but *how* they think has not come easily. We think a series of experimental observations can variously be credited as having either produced or at least marked a change in perspective. One is the revival of research suggesting that language affects thought (e.g., Boroditsky, 2001; Gentner & Goldin-Meadow, 2003; Gumperz & Levinson, 1996; Lucy, 1992; Wolff, Klettke, Ventura, & Song, 2005). A second force is the large body of research documenting cognitive consequences of East-Asian collectivism versus Western individualism (e.g., Masuda & Nisbett, 2001, 2006; Nisbett, 2003; Oyserman, Coon, & Kemmelmeier, 2002). These now well-documented cultural differences range from basic perceptual processing, such as field dependence and change detection, to categorization, reasoning, and attribution processes.

These two lines of work are convenient bridge builders between anthropology and the rest of cognitive science because language and individualism seem like quasi-independent variables that one might be able to manipulate. Indeed there is now an accumulating litera-ture on the priming of individualism and collectivism (e.g., Brewer & Gardner, 1996; Gardiner, Gabriel, & Lee, 1999; Kühnen & Oyserman, 2002; Oyserman & Lee, 2007) and evidence that the cognitive performances of bicultural bilinguals may vary with the language used in testing (e.g., Hong, Morris, Chiu, & Bent-Martínez, 2000). However, we think these bridges should be considered as rather temporary and something to be replaced when anthropology is more solidly within the cognitive science fold.

A perhaps even more cogent type of observation linking culture and thought are studies showing that basic cognitive phenomena based on studies with undergraduates do not gener-alize to other populations (e.g., Atran & Medin, 2008). In some cases these differences can be linked to differences in a single variable such as expertise (Medin & Atran, 2004), but in others the cultural differences noted appear to be based on a complex of factors implicating different frameworks or epistemological orientations towards the natural world (Atran, Medin, & Ross, 2005; Bang, Medin, & Atran, 2007). These observations are more challeng-ing to researchers who would like to think of culture as if it were an independent variable. To paraphrase one of the reviewers of this paper: Considering culture is not just a nice thing—it is essential for the future health of cognitive science in general and cognitive psychology in particular.

Although documenting cultural differences in thought provides powerful counter-examples to cognitive scientists who would prefer to ignore them (to study ''only what is universal''), they are more of a beginning point than an end point. Explanations of pheno-mena that only refer back to the differing cultures are inherently circular; the challenge is to

provide a theoretical framework for analyzing and understanding cultural processes. This challenge is what motivates anthropologists to probe into the details of a series of related phenomena and, in some cases, return to the field year after year. The very level of depth that anthropologists relish may be met with impatience by other cognitive scientists who just want to know the bottom line so that they can move on. Sometimes it is as if other cognitive scientists are trying to identify the taxonomic category that applies so that they can classify the phenomenon in question while anthropologists are trying to understand the ecosystem within which the phenomenon resides (Hutchins, in press).

One area of potential bridging between anthropology and the rest of cognitive science are studies that focus on particular domains of cognition such as naïve biology, naïve psychology, naïve physics, language, categorization, numerical competency, spatial and temporal cognition, food cognition, kinship and other social networks, moral judgment, and (cognitive aspects of) emotions (e.g., Astuti & Harris, 2008; Astuti, Solomon, & Carey, 2004; Beller & Bender, 2008; Beller, Bender, & Song, 2009a,b; Bender & Beller, 2007; Bender, Spada, Seitz, Swoboda, & Traber, 2007; Bennardo, 2002, 2009; Bennardo & Read, 2007; Bloom, Peterson, Nadel, & Garrett, 1996; Carey, 1985; D'Andrade & Strauss, 1992; Haidt, 2001, 2003; Haidt, Koller, & Dias, 1993; Hirschfeld & Gelman, 1994; Holland & Quinn, 1987; Hutchins, 1983; Leslie, 1994; Levinson, 2003; Majid, Boster, & Bowerman, 2008; Rozin, 2007; Shweder, 1991; Spelke, 2003; Tomasello, 1999). These sorts of studies are well represented in both anthropology and other cognitive science subdisciplines.

We think that these developments merit a second look at what cognitive science and anthropology have to offer each other. Anthropologists gravitate towards meaningful problems that select person or persons plus context as the relevant level of analysis, rather than focusing on a single, context-less mind (e.g., Hutchins, 1995). In fact, some argue that there is no such thing as context-less mind. Cole (1996), a self-proclaimed cultural psychologist, laments how difficult it is to ''keep culture in mind.'' In addition, anthropologists tend to systematically analyze and sample domains that are of practical interest to the people who depend on the knowledge. For example, ethnobiologists begin their work by first identifying the plants and animals in a study area and then are in a position to ask a series of questions about which kinds are named and what role they play in the local ecology and economy (e.g., Hunn, 1999). Anthropologists also recognize that data collection situations are inherently social and contextual, a lesson that has often been ignored outside of anthropology (see, Keysar, 1994, 2007, for an exception).

There are also rich connections between cognitive science and anthropology through biological anthropology and linguistic anthropology. Biological anthropology now contributes to our understanding of the evolution of mind and the evolution of the capacity for culture through comparative studies of human and primate cognition (Byrne, 2006; Johnson, 2001; Johnson & Karin-D'Arcy, 2006; Tomasello, 2009). Linguistic anthropology continues an active exchange with cognitive science via pragmatics, conceptual processes, and studies of gesture. Several recent edited volumes have brought anthropologists together with other cognitive scientists to address shared questions concerning human interaction (Enfield & Levinson, 2006; Gentner & Goldin-Meadow, 2003; Kita, 2003; McNeill, 2000; and see Levinson, 2003).

4. The future: Prospects and projections

One plausible reason for the low visibility of anthropology in the cognitive science community is relative size of populations: Compared to psychology, anthropology is small, and compared to cognitive psychology, cognitive anthropology is even smaller. However, beyond this simple demographic fact, restoring the role of anthropology within cognitive science will be no simple task. In a survey we conducted recently among anthropologists, several respondents drew pessimistic conclusions for the future, like the following:

> What could challenge this pattern of separate intellectual traditions would be sustained, respectful, serious interaction. This would require a dedicated effort to make that happen over a number of years and continual conversations, in workshops, conferences, panels, journal issues, and on websites to find or develop points of convergence and collaboration that many in both fields would eventually acknowledge, see the use of, and begin to adopt. Are you willing to put in that time and that effort? Is anyone?

We agree that this will take effort, but we are also convinced that the common goal is worth the effort. Anthropology is not, at its best, just a good neighbor beyond a good fence. Instead it is an inalienable partner in the common endeavor to understand human cognition. Members of each group need to feel attracted to what ''the others'' are doing and thus increasingly to pull down the fences. How might this be achieved?

The first step would be to recognize those on the other side as potential partners, as people who have something to offer. To start with the good news: Some have never ceased to do so, and they have kept the communication going. But a majority of cognitive anthropologists lack the feeling of being taken seriously. In this regard, reviving curiosity and fostering interactions is a good starting point, yet in order to be effective, this needs to be coupled with respect and a willingness to consider alternative perspectives (such as the idea that a careful, real-world observation, however ''messy'' it might be, may provide as much or more insight into cognition than a tightly controlled, artificial study with undergraduates).

The next step would be identifying common goals and motivations. The recent upsurge of interest in culture and cognition alone will not, by itself, suffice to draw anthropologists and cognitive scientists closer to each other. Why not put some of those topics on which they disagree on a shared research agenda? One place to begin might be a serious discussion of differing conceptions of culture and cultural processes and their methodological and theoretical implications.

There are also important conceptual questions that would benefit from multiple perspectives. For instance, are cognitive processes really universal? Findings from all levels of scale—from neuroplasticity (Doidge, 2007) up to representational effects (Zhang & Norman, 1995)—provide good reasons to question this assumption. If the processor is not universal, why should processes be? If the brain is organized by experience, and experience is organized by culture, should we then not expect that culture is a formative force in cognitive processes? Of course, questions concerning the definition and meaning of universals are themselves challenging and intriguing (e.g., Norenzayan & Heine, 2005).

These considerations open up further research questions. In order to assess the extent to which cognitive processes may be universal, we need to collect an inventory of cognitive processes across cultures and contexts, as well as an inventory of how processes are organized and how they interact with content and context (e.g., Bang et al., 2007). In order to assess how culture serves to constitute cognitive processes, we need to get back to the first of Norman's (1980) twelve issues for cognitive science and try to understand the cultural systems of knowledge (i.e., the belief systems), including their cognitive and ecological constraints and the cognitive capabilities which produce and shape cultural knowledge. This would necessarily imply bringing back some of the components expelled from the cognitive sciences in their early times (Gardner, 1985)—affect, context, culture, and history—as these define what the ''cognized'' means and why it matters.

The final step would be to combine complementary approaches to similar problems. A particularly promising option is the systematic survey of a specific domain by interdisciplinary teams. It is no coincidence that this paper is co-authored by people from different disciplinary backgrounds, each of whom has been engaged in interdisciplinary collaboration for quite some time (e.g., Atran & Medin, 2008; Beller & Bender, 2008; Hollan, Hutchins, & Kirsh, 2000). Such collaborations are not always simple, but they are invaluable for keeping communication going, establishing common ground, and enabling new insights by joining perspectives and expertise from diverging backgrounds.

One of the high hopes connected to the rise of the cognitive sciences was that, one day, they would cease to be segregated by disciplinary borders or fences and emerge as one cognitive science (Gardner, 1985). Though this was a bold vision, attempts are still being made to approach its realization, most recently with the establishment of the International Cognition & Culture Institute,[2] which endeavors to provide a virtual platform for all kinds of interdisciplinary initiatives. This trend hints at a future we would be eager to meet.

Notes

1. This fission did not correlate perfectly with the four subfields described earlier.
2. The ICCI was established by the London School of Economics Departments of Anthropology and Political Science in collaboration with the Jean Nicod Institute in Paris.

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