



# The foundations of neuroanthropology

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Studies of culturally-based phenomena within neuroscientific frameworks represent one of the most dynamic tendencies in contemporary cognitive science. They have provided the foundations of social neuroscience, which comprise studies on brain correlates of social cognition, abilities, and disabilities (Cacioppo, 2002), and have contributed to the consolidation of evolutionary neuroscience as a multidisciplinary epistemological field, which frequently involves social neuroscientific topics, considered in terms of their function and evolutionary basis (for an authoritative introduction and discussion: Platek et al., 2007).

The new horizons that these studies revealed now allow for neuroscientific approaches to topics that once were conceived to be beyond the scope of a naturalistic framework, because they remained subordinated to contingent dimensions of the cultural environment (e.g., embodiment; Campbell and Garcia, 2009).

Such efforts have widened the scope of social neuroscience and raise very interesting perspectives for evolutionary neuroscience, in terms of the adaptations and brain circuits that appear to lie at the base of these phenomena, as well as suggest an incursion into a dialogue with studies pointing in the opposite direction, which question the bases of certain universal cognitive and behavioral phenomena that are, by and large, thought of in terms of their functional basis – like Everett et al. (2005) did in relation to universal grammar, when arguing that the Pirahã language has no recursion, no subordination, no numeral, and “in effect, no phrase structure” (Everett, 2007, p. 4); and like Henrich et al. (2010) did in their critical review of research on “WEIRD” people (“Western, Educated, Industrialized, Rich and Democratic”), which they claim to have biased several generalizations about “human nature”, from perception (e.g., different standpoints in relation to the Mueller-Lyer illusion) to abstract cognition (e.g., egocentric

vs. geocentric reasoning styles in tasks requiring spatial cognition)<sup>1</sup>.

The study of the relation between culturally-specific phenomena and brain activity has been named neuroanthropology (a term coined by E. D. Lewis, from the University of Melbourne) and proposes to be “the study of the experiential and neurobiological aspects of cultural activity” (Dominguez Duque et al., 2009, p. 3). Considered within this perspective, it seems compelling to assume that we are moving into the era of neuroanthropology (see: Campbell and Garcia, 2009), where the tradition of studies of culturally-dependent phenomena meets the tradition of studying brain mechanisms to consolidate a new epistemological field. However, the thesis that this paper endorses is that the consolidation of neuroanthropology as a new and legitimate epistemological tradition will require significant new efforts.

The first thing that is important to bear in mind is that the authority of new fields of research rely on the premise that they introduce new lines of research, which cannot be perfectly characterized within the epistemological structure of a previously established field of research (Kuhn, 1977). Many anthropologists conduct research within natural science frameworks, such as social and evolutionary neuroscience, and up to this point there was no clear reason to consider that these works represent new epistemological traditions, since these studies are all committed to the questions, methods, and theories that are dear to the natural sciences.

Hence, it follows that the emergence of neuroanthropology as a concept announcing something new implies that these studies introduce methods and questions of interest to the social sciences – especially anthropology, which has been argued “to be a philosophical holdout against ‘reductionist’ neuroscience” (Campbell and Garcia, 2009, p. 1).

<sup>1</sup>This paper is expected to appear in *Brain and Behavior Sciences*, during the year of 2010.

Such questions of interest to social anthropologists represent the real challenge of neuroanthropology. The reason for this difficulty is the same that warrants neuroanthropology as a potential breakthrough. Unlike evolutionary neuroscience and other multidisciplinary fields of research where both parts are committed to the principles and methods of the natural sciences, neuroanthropology presents a difficulty in bridging the gap defined by the different interests and ‘hard problems’ established within the bounds of social neuroscience and of social anthropology. The field relies on the great importance that social anthropology historically has attributed to that which neuroscientists call contingencies, when defining the necessary and sufficient conditions for certain culturally-specific phenomena to emerge. This focus automatically raises related issues, and hence evokes ‘hard problems’ that can only be resolved by very specific ‘neuroanthropological’ studies.

In order to expose this thesis, I propose to discuss one feature in Campbell’s and Garcia’s (2009) paper, related to the subjective experience of the body (embodiment) and its association to both cultural determinants and to neurobiological correlates. As the authors emphasize, this bodily representation makes reference to a traditional topic of interest in social anthropology (Csordas, 1990), which can also be thought of in terms of somatic representations in the brain. As pointed out by the authors, recent studies (e.g., Craig, 2009) suggest that embodiment involves insula activity, which in association with the anterior cingulate activity represents one of the most prominent brain correlates of long term meditation, yoga, and ritual experiences, like the altered perceptions induced by Ayahuasca.

In principle, the combination of these ideas is straightforward: it is possible to include some discussion on brain correlates within the anthropological studies on embodiment in the same way that it is possible to turn this into a valid discussion within

the scope of social neuroscience. However, there is a gap between this valid conclusion and the concerns that turn embodiment into one of the 'hard problems' of social anthropology, as posed by Csordas (1990), whose interests in the matter investigate the specific experiences of evil and divine within the healing practices of the charismatic Christians in North America, and the disclosure of the elements that lead to the uniqueness of the phenomenon under study. According to Csordas, "physiological explanations in terms of trance and altered states of consciousness, or catharsis and nervous-emotional discharge, do not take us very far unless we are willing to accept trance and catharsis as ends in themselves rather than as *modus operandi* for the work of culture" (Csordas, 1990; p. 32).

Considering this example as one that can characterize the tensions that underlie the emergence of this new field, neuroanthropology has to contribute with an understanding of the variables that condition the phenomena in specific conjunctures, neutralizing the caveats that were placed by Csordas, nearly two decades before this discussion takes place. This is not to say that a strong multidisciplinary engagement between neuroscience and anthropology is not achievable. Below I present examples of possible lines of research on embodiment (also considered as an example) that can meet the necessary and sufficient conditions of a strong sense of multidisciplinary that have been described above:

- (1) What exactly changes in the brain of someone from a certain ethnic group while he engages in a mystic experience, and to what extent does it resemble the brain changes that occur in members

of other communities, who partake in similar practices? In other words, are there any brain signatures that can help to discern embodiment from one cultural context to another?

- (2) Are there any qualitative or quantitative differences in brain dynamics in the trance of a spiritual leader and of a follower? If so, can these differences be reduced to the ones commonly found in relation to social status within an urban environment?
- (3) Do brain correlates of speaking in tongues resemble those of normal language? If not, what are the core neurological differences and to what anthropological tenets are they most likely associated?
- (4) Are there differences in patterns of brain activation within mystical experiences among members of groups that use ritual drugs (e.g. Ayahuasca), as compared to members of groups that do not use them? To what extent do differences in brain activation produced by different ritual drugs correlate with different ritual practices?
- (5) Is there a difference in the brain dynamic between a subject using a ritual drug outside of a ritual (e.g. during a brain scan experiment in a hospital) and within the ritual context (e.g. the MRI scanner is taken to the field)?

In conclusion, the development of studies focused on the potential neurobiological differences/similarities between individuals who occupy different roles in a community and also studies on the social and biological differences/similarities between communities are part of the scope of neuroanthropology, while studies

on brain activity alone (e.g., brain correlates of embodiment as a general idea) are not part of this new field, whose two distinct players need to partake in a thoughtful methodological dialogue in order to arrive at a common goal.

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