

Radiality: A Tongan Cultural Model

This research elucidates the existence of a foundational cultural model in a Polynesian culture, the Kingdom of Tonga. In so doing, a number of central issues in anthropology, cognitive anthropology, linguistics, cognitive psychology, cognitive science, and sociology are discussed in depth. For example, regarding the nature of knowledge representation, a distinction is proposed between mental model and cultural model and how they both differ from schemas (or schemata). Regarding the relationship between language and thought, a dynamic engagement is suggested and a distinctive role for metaphors is envisaged. A clear relationship between cultural models and behavior is asserted as well as a transparent link between various cognitive modules. The role of the spatial relationships module (i.e., space) in the cognitive architecture is presented as fundamental in understanding the internal organization of other modules (or knowledge domains) with which it interacts. Finally, social network analysis is used while investigating the cognitive nature and organization of social relationships.

A mental model consists of bits of knowledge organized in such a way as to facilitate storage and/or retrieval/use of that same knowledge (Craik, 1943; Gentner and Stevens, 1983; Johnson-Laird, 1983). I propose to call “radiality” a specific type of mental model, a Tongan foundational cultural model. The choice is motivated by proposals made by Lakoff (1987), Holland and Quinn (1987) and Shore (1996). Lakoff suggested and elaborated the concept of “image-schema” defined as: A way of thinking about one’s experience in the world derived from “... relatively simple structures that constantly recur in our everyday bodily experience: [...] and in various orientations and relations: *UP-DOWN*, *FRONT-BACK*, *PART-WHOLE*, *CENTER-PERIPHERY* [my italics], etc.” (1987:267). Holland and Quinn argue that a “thematic effect arises from the availability of a small number of *very general-purpose cultural models* [my italics] that are repeatedly incorporated into other cultural models ...” (1987:11). And Shore states: “*Foundational* [my italics] schemas organize or link up a “family” of related models.” (1996:53).

I define radiality as a ‘mental’ model, because in Johnson-Laird’s (1999) words “A crucial feature [of mental models] is that their structure corresponds to the structure of what they represent.” (p. 525). The investigation of mental models, then, is enhanced by a thorough understanding of the context (physical and human) in which they are acquired and realized. I call it a ‘cultural model’ because in D’Andrade’s (1989) words it is “a cognitive schema that is intersubjectively shared by a social group.” (p. 809). Finally, I chose to term it ‘foundational’ because it is shared by a number of knowledge domains in various cognitive modules (Shore, 1996). In other words, radiality is conceived as a fundamental cognitive process that is used to organize knowledge across mental modules. Its intrinsic nature is spatial and as such it belongs to the spatial representations module (see Jackendoff, 1997). Tongans, though, preferably adopt/use radiality in other domains of knowledge— exchanges, religion, kinship, social networks, political action, and social relationships—in other modules, including the action module and the conceptual structure module. The existence of radiality does not exclude the presence of other foundational cultural models.

The decision to posit radiality as a foundational model and to investigate the domain of social relationships was also influenced by two other bodies of literature: one about a number of

proposals suggesting radially in many aspects of Eastern (e.g., Nisbett, 2003), South-East Asian (e.g., Kuipers, 1998), Micronesian (e.g., Ross, 1973), and other Polynesian societies (e.g., Shore, 1996; Herdrich and Lehman, 2002); and one containing current ideas about the content of a ‘cultural’ component-module of the mind (e.g., Jackendoff, 1992, 1994, 1997, 2007; Pinker, 1997; Talmy, 2000a, b) that is orchestrated around the mental representations of social relationships (i.e., kinship, group membership, dominance).

When representing spatial relationships in small-scale space in long-term memory, Tongans prefer the absolute frame of reference. The specific subtype of the absolute frame of reference that they use is one that I have called “radial” (Bennardo, 1996, 2002a). *A fixed point of reference in the field of the speaker is selected and objects are represented as from or toward that point.* It is this non-ego based (other-based) mental organization of knowledge in the spatial relationships module (radiality) that is found repeated in the preferential organization of other knowledge domains in other mental modules and as such it is proposed as a foundational cultural model.

The notion of foundational cultural model I adopt needs some clarification. In cognitive psychology, Brewer defines schemata (preferred plural of schema for psychologists) as “the psychological constructs that are postulated to account for the molar forms of human generic knowledge.” (1999:729). He traces the origin of the concept back to Kant, Bartlett, Piaget, and more recently to Minsky (1975) who called these “molar” constructions frames. A subtype of schema for sequences of actions is called script by Schank and Abelson (1977).

Schemas (preferred plural of schema for anthropologists, but see Casson, 1983; Keller, 1992) are proposed as abstract mental entities whose content does not need to be completely filled before the whole structure is activated/retrieved. Thus, in talking about an ‘eating at a restaurant’ event, people do not need to relate all the parts of the ‘eating at a restaurant’ schema and at the same time expect the same/similar schema to become activated in its entirety in the other person’s mind. It is this type of “cognitive schema” that D’Andrade is advocating as “shared” in his definition of cultural model given above.

I propose as a foundational cultural model a schema (or mental model) that, besides being shared by a group of individuals, is primarily shared by a number of cognitive modules and by a number of knowledge domains in each individual. Basically, I am proposing to call a foundational cultural model a homology in the organization of knowledge across mental modules and in various knowledge domains. This organization (or structure) is a set of relationships between units of knowledge that results from the generative capacity of higher-level mental processes—they derive from them. The structure itself also exhibits generative capacities and is capable of realizing a variety of instantiations—it generates a number of cultural models.

This proposal is indebted to the “image-schema” concept suggested and elaborated by Lakoff (1987) in cognitive semantics and more recently by Mandler (2004) in developmental psychology. In cognitive anthropology, I was also influenced in my thinking by the “foundational schema” concept introduced by Shore (1996). Both suggestions, though, fell short in satisfying what I needed to explain my data. Thus, the genesis of the ideas shortly introduced in the above paragraph.

The proposal is new in three ways. First, it forces one to look for similar organizations of knowledge across mental modules and knowledge domains within an individual mind, and across individuals, i.e., members of a social group/community. Second, it looks at these mental structures as a stage in the cognitive understanding and construction of meaning and behavior. Reasoning, inferences, deductions, beliefs, and behavior (including linguistic behavior) undergo

this generative process and are affected/molded at this stage. Third, it dovetails with research conducted on individualism versus collectivism (Triandis, 1995; Kusserow, 2004; Greenfield, 2005). Radiality, in fact, is seen as the generative mental engine behind various forms of collectivism.

Supported by two NSF grants (#0349011 and #0650458), during my search for evidence of the hypothesized cultural model, I collected and analyzed a variety of data—ethnographic, linguistic, experimental, behavioral, social networks, and geographic (e.g., GIS and 3-D renderings)—and used a number of methodologies— participant observation, interviews, semantic analyses, analyses/parsing of texts, administration of experimental tasks (e.g., memory tasks, drawing tasks, sorting tasks, kinship tasks), administration of questionnaires, indirect observation of social networks, social network analysis—in a cross-disciplinary fashion. The motivation for such an array of data and methods is to be attributed to the cross-domain (knowledge) and cross-modular (cognition) investigation conducted.

For example, linguistic data were gathered to conduct semantic analyses of the spatial relationships domain, e.g., spatial prepositions, spatial nouns, and directionals. Some of these same data and others were also analyzed to achieve an understanding of specific linguistic practices, i.e., instances of language use. Usage patterns and preferences emerged that enhanced the supporting evidence available for the main hypothesis. Moreover, some data was analyzed in a multi-dimensional fashion. For example, some linguistic data such as interviews about social relationships (i.e., telling a story) were analyzed both for linguistic reasons (e.g., frequency of use of some lexemes), for social network purposes, (e.g., influence structure of the village), and for cognitive objectives, (e.g., dimensions of the group—number and type of individuals—recalled and mentioned as an indication of specific forms of mental representation of those same groups).

The following statement summarizes the major findings obtained: radial organization is pervasive in the Tongan domains of knowledge and mental modules investigated. The findings, besides supporting the hypothesis, have relevance for the way in which the human cognitive architecture can be conceptualized. Specifically, a number of domains of knowledge are shown to share a similar fundamental organizations, a foundational cultural model, thus indicating a specific way in which cross-modular interactions may take place. The role of cultural models in cognition is clearly established, but many questions about the specifics of its significance still remain.