

COMPLEXITIES

Beyond Nature & Nurture

Edited by Susan McKinnon & Sydel Silverman

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CHAPTER 3

The Eye of the Beholder: How Linguistic Categorization Affects "Natural" Experience

Eve Danziger

QUESTION: What do you call a guy who graduates at the bottom of his medical school class?

ANSWER: Doctor.

This joke illustrates how human categorization imposes artificial discontinuities onto continuous phenomena. The categories thus created serve a variety of social, symbolic, and practical purposes. Anthropologists have found that the more socially and symbolically useful a particular category is in a society—innocent or guilty? friend or foe?—the more necessary it is to impose a strict conceptual discontinuity at the point where an appropriate reference must be distinguished from an inappropriate one (Durkheim and Mauss [1901] 1963; Lévi-Strauss [1962] 1966; Douglas 1966).

Much more interesting than the mere fact that humans categorize in this way is the fact that, once imposed, the arbitrary discontinuities of human classification can take on a conceptual life of their own and apparently have the power—to different degrees in different cases—to foster in their users the persuasive illusion that the reality that is classified is actually objectively discontinuous. Why else indeed, but for the realization that one may have entertained such an illusion about the concept "doctor," is the exchange above perceived as a joke and not simply as a statement of fact?

The tendency to believe that the categories conventionally imposed by one's particular cultural and linguistic tradition actually label preexisting and natural units of reality is widespread across human societies. Recognition of this phenomenon has underpinned the anthropological enterprise for most of its history. Recently, a powerful critique of the entire Western philosophical tradition along the same lines (Lakoff and Johnson 1999; see

also Lakoff and Johnson 1980) has also emerged in the new interdisciplinary field of cognitive linguistics. The critique put forward by cognitive linguistics is that classic philosophical approaches are in error wherever they claim that putatively objective and essential categories transcend the perspective of their human users. It traces the origins of such doctrines to the intellectual illusion that linguistic categories simply name or label independently existing units of reality, a view of human linguistic categorization that has been dubbed the "classical categorization" view (Lakoff and Johnson 1980) because of its origins in the philosophy of Aristotle.

The "classical" approach proposes that linguistic categorization is a matter of identifying the common feature or features intrinsically possessed by all of the entities that belong in the named set. There is no room in this view for half measures; if an entity is perceived to possess the feature that licenses membership in the category, it is granted conceptual status as a full member of the category, regardless of other attributes that might make its membership questionable. This is illustrated in the *doctor* exchange, which shows how little room there is in the conceptual category corresponding to English *doctor* for gradations of membership. I will refer to this type of categorization as the "all-or-nothing" type, and to the corresponding view of reality (entities exist in reality as discrete units that are readily distinguishable from one another; reality is not a continuum) as the "discontinuity illusion."

In unmasking the discontinuity illusion, a large proportion of the effort within cognitive linguistics has gone into exploring the graded nature of the realities to which words actually refer and into defending the role played by human experience, rather than by preexisting states of "objective" reality, in linguistic categorization (Lakoff 1987; Langacker 1986, 1987; Jackendoff 1987). The reopening of such familiar anthropological lines of argument from within cognitive science, and directed at the Western intellectual tradition, is welcome indeed. In particular, cognitive linguistics has taken aim squarely at the geneticized version of objectivism that has dominated linguistics for the last half century. In the view of Noam Chomsky (1975) and his followers, all significant linguistic categories exist independently of the situation of their users—including the particular language learned. The categories are present from birth, encoded in human DNA in a form that is autonomous of any subsequent experience.

Yet, even while effectively reestablishing human experience as foundational in the study of language, cognitive linguistics has been increasingly inclined to restrict the kinds of experience it is willing to consider to purely sensorimotor forms. It focuses on the kinds of experience that owe their existence to the physiology of the human organism, and it neglects those that come with belonging to a particular social or cultural group. This tendency

has culminated in the announcement of an entirely new paradigm in the study of human affairs. The self-styled "embodied mind" approach (Lakoff and Johnson 1999) places individual sensorimotor experience at the heart of human categorization, and therefore at the heart of all of the human sciences. This paradigm assumes that there exists a fundamental and readily intuited distinction between "natural" firsthand physiological experience and experiences originating in social life or cultural convention. In this view, not only are all individual physiological experiences alike cross-culturally, but they are also thought to underlie and inform those experiences deemed to originate in social and cultural conventions.

In what follows I will use two case studies from my own research to underscore the point that, in fact, the reverse is often true. Both social scientists and perceptual psychologists know full well that "all-or-nothing" categorization, and the accompanying illusion that words function to name the units of an objective and discontinuous reality, are not confined to the tomes of Western philosophy but are also a widespread fact of everyday human life, even in non-Western societies. As such, our everyday intuitions about what is "natural" in human experience—including sensory experience—are often the products of the very categorization processes that cognitive linguistics invokes these intuitions to explain. Cognitive linguistics misses this essential point by continuing, in the Chomskyan vein, to treat language as purely an individual phenomenon to be reinvented by each individual in every generation. But linguistic and other cultural categories are collective conventions that themselves can inspire and construct, as well as reflect, aspects of the individual's experience.

Classical Categorization and the Discontinuity Illusion in Everyday Life: Two Case Studies

In its emphasis on experience rather than on innate structures in accounting for linguistic meaning, the cognitive linguistics approach represents a significant advance over its immediate predecessor: the hyperrationalism of the Chomskyan view. The positive contribution of cognitive linguistics has been to promote the role of the human subject in understanding the making of meaning. The categories in which humans think do not preexist them in some transcendental fashion, and they have no "objective" reality beyond the confines of human experience (see also Sapir [1933] 1949). However, the kind of experience that is imagined to underlie human cognition in the cognitive linguistics paradigm is that of the purely sensorimotor, not understood to be significantly modified by the intrusion of particular cultural or linguistic practices. In reverting to a notion of experience that thus ap-

peals to sensory universals at the expense of cultural particulars, this valuable advance is in danger of degenerating to become yet another reductionist and universalizing model of human life and human meaning.

The problem resides in a view of language that cognitive linguistics appears to have inherited from the Chomskyan paradigm—that language is a phenomenon properly studied at the level of the individual organism alone. But individual human experience always very saliently includes experience with preexisting linguistic and cultural categories. The protestations of cognitive linguists to the contrary, these categories indeed often show "classical," all-or-nothing structure and may project their conventional divisions of reality onto the experience of the physiological individual. Therefore, our own intuitions about what is universal and natural, even in sensorimotor experience, may well themselves be the products of cultural classification.

To reinforce these points, I now discuss two different cases from my own work. I show, first, that all-or-nothing categorization, involving feature-based definitions, indeed occurs in everyday human life and, second, that the structure of such categories imposes itself upon the individual experience of their users, giving the users the intuition of self-evident "naturalness" (the discontinuity illusion). The first example describes some of the ideas, practices, and intuitions surrounding family relationships among the Mopan Maya, a group of subsistence farmers located in Central America. The second concerns the difference between the perceptual intuitions of literate and nonliterate people in several language communities when confronted by two-dimensional mirror-image reflections.

CASE STUDY 1: CLASSICAL CATEGORIES AND EVERYDAY LIFE

Cognitive linguistics made its reputation on the discovery (Berlin and Kay 1969) that speakers often agree in their intuitions that certain of the referents denoted by a linguistic term can be considered "better examples" of the term than others. For example, American English-speaking college students overwhelmingly agree that *robin* is a better example of *bird* than is *penguin* (Rosch 1978). This general finding has led to the proposal that linguistic categories are internally structured in cognition, with "best-example" (focal) referent concepts at the psychological center and other referent concepts at the psychological periphery. Peripheral referents are understood to be linked to the central one(s) through associative chains called semantic extensions (see Lounsbury 1964, 1969, for early theoretical statements of the idea). So, for example (Lakoff 1987), if we ascertain by asking a number of English speakers that a woman who conceives, bears, and rears her child is the best-example referent of the English linguistic category *mother*, then we propose a cognitive structure for that category in which this referent is at the

center, and other possible referents (surrogate mothers, adoptive mothers, classificatory mothers, reverend mothers) occupy the conceptual periphery and are attached to the best example by various and different associative links. It is also proposed that the best-example (focal) referent is such by virtue of "natural" and directly physiological experience with such referents around the world (see also Malinowski 1930).

It is further often noted that the center-and-periphery structure collocates with "fuzzy edges" in a category. That is, categories are often not strictly bounded in human reflective intuition; if we get sufficiently far from the center of our category, we may discover that native speakers are without certainty when asked whether a given referent should count as a member of the category at all (e.g., *pterodactyl* for *bird*? *ovum donor* for *mother*?). The view that the clear-center-and-fuzzy-periphery kind of conceptual structure is pervasive—not only in speakers' reflective judgments about word meanings but also in everyday linguistic practice—is widely proclaimed today, and analyses in this vein proliferate (Lakoff 1987; Langacker 1986, 1987; Kronenfeld 1996; G. Palmer 1996).

Clearly, this is a very different view of categorization from the all-or-nothing view described above. In classical categorization, recall, referents are believed to cohere into categories by virtue of their possession of some common defining feature. In that model, all legitimate referents are equally good examples of the category, and there can be no uncertainty about category membership: a referent either does or does not possess the characteristic (often an essential quality) that licenses membership in the category. Cognitive linguistics has done an excellent job of pointing out how the very notion that referents inherently "possess" certain attributes—rather than that humans experience them in certain ways—has been the gateway to all sorts of fallaciously objectivizing or transcendentalizing scholarly accounts of the universe (Lakoff and Johnson 1999).

The power of the critique is marred, however, by the fact that cognitive linguistics tends to dismiss all-or-nothing categorization as the preserve of dusty and mistaken philosophers, the absentminded descendants of Aristotle, who are out of touch with the realities of linguistic categorization in the lives of everyday folk. Cognitive linguistics discerns correctly the power of classical, all-or-nothing categorization to create the discontinuity illusion—the illusion that reality matches up neatly with the units of language. But in its enthusiasm to celebrate its discovery of clear-center-and-fuzzy-periphery categorization, cognitive linguistics ignores the actual pervasiveness of feature-based categorization—complete with discontinuity illusion—in all societies (irrespective of Aristotelian influence) and at the most everyday level.

The Mopan Maya are an indigenous group of farmers located in eastern Central America, descendants of the famous ancient Maya of the same region.¹ Among these people today, much respect is paid to age and experience. The members of your family are terminologically distinguished by whether they belong to your own or to your parents' age-grade, rather than by what English speakers would consider their exact genealogical relationship. For example, a parent's sibling who is close to yourself in age is classified with your own siblings, but a parent's sibling who is much older than yourself is classified with your grandparents (see Danziger 2001b for details). Of course, age is a continuum, but in Mopan it is culturally important to determine exactly to which age-grade category each of your relatives belongs so that you can offer to each of them the correct degree of respect by using the correct age-grade term in greeting him or her. If you do not address a relative with the appropriate relationship term, you will be considered very rude and are likely to be told that you are behaving "like a dog" or "like an animal." If your relative is of the opposite sex from yourself, failure to greet him or her with the right age-grade term provokes especial horror, of the kind associated with incest taboo violations.

As well as monitoring their own speech, Mopan speakers judge others' use of age-graded respect greeting terms and they scrutinize it for impropriety. If speakers are to avoid scandal and sacrilege, they must know whether or not a kinship term applies to their own relationship with every other individual in the community. If such a term is applicable, they must know what term it should be. And Mopan people *do* know. Parents inform their children about respect relationships and instruct them from childhood. All those who are considered relatives belong to one or another of the age-graded terminological categories, and there is never uncertainty as to which category is correct for a given individual. Most importantly for our purposes, Mopan speakers do not believe that these terminological categories are matters of convenience or arbitrary labeling. They believe (as we do) that their kinship terms label actual statuses that preexist their labels.

An interesting situation arises when a young Mopan person gets married. All of one's new spouse's siblings will become one's in-laws, and it is suddenly necessary to decide which terminological category is the right one for each. Once again, age-grade is the determining factor. A spouse's eldest sister, for example, is as likely to be classified with the mother-in-law as with the younger sisters (fig. 1). At engagement parties, time is set aside for elders to debate and ultimately to declare in public exactly what the new spouse will henceforth call each of the new in-laws. Since this requires that discontinuous categories be created over what is actually a continuous field (age), this is no simple matter. Foreseeably, there is often difficulty in agreeing on

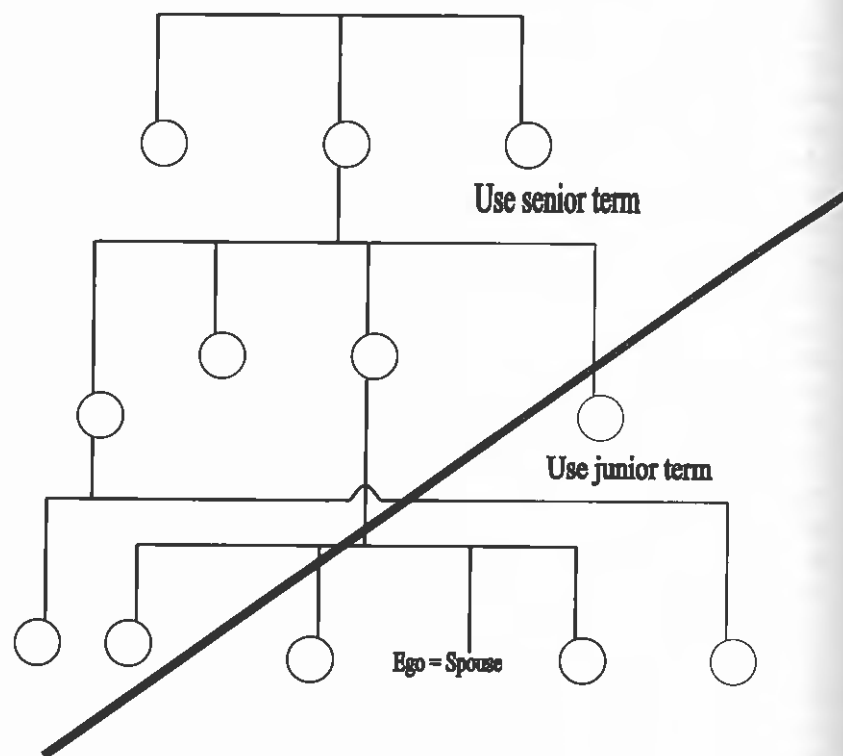


Figure 1. Mopan relationships acquired through marriage. Relatives in the same generation are ordered left to right in order of decreasing chronological age.

the term to apply to a particular relationship. But even where there is explicit difference of opinion, every candidate is, by the end of the gathering, firmly placed by public fiat squarely into one category or another—there are no “fuzzy” cases allowed.

Certain aspects of the whole procedure appear clearly arbitrary to the outside observer. But from the discussions that occur, it is equally clear that the participants believe that their decision about which term to apply, although a thorny one, should be guided by the effort to discover the “true” nature of the referent. To them the issue is to decide whether this person is “objectively” in the new spouse’s age-grade or not.²

This is a case of classical categorization engaged in by unlikely Aristotelians—and for the purposes of everyday life. Clear judgments about category membership across what is actually a continuous referential field (relative age) are culturally required. This means that, just as in our *doctor* example, some assignments of referents to terminological category are not

clear or best-example cases. But—again as illustrated in the *doctor* exchange—the participants entertain the strong intuition that all cases are clear *once* decided. They maintain that the terminology follows reality, and not vice versa. Most important of all, this is not by any means a special situation. Anthropologists have determined that social categorization of this classical, all-or-nothing sort occurs very frequently around the world. And intuitions as to the naturalness of the realities so classified are often very strong indeed.

CASE STUDY 2: PHYSICAL PERCEPTION AND CULTURAL CATEGORIZATION

Cognitive linguistics has made a distinct contribution in pointing out that linguistic categories owe their existence to human experience with referents and not to the properties of the referents themselves. But as work in this paradigm has progressed, the kind of experience that is invoked to play the crucial role of best-example referent in most cases of linguistic categorization has increasingly been drawn from an imagined, so-called natural realm of individual sensory perception and physical movement, shared by all humans, and now explicitly understood to be located in human neurology (although not necessarily in genetics). The cognitive primacy of this unproblematically noncultural realm of “human-sized experience” (Lakoff 1987) in cognitive linguistics is no longer a hypothesis to be tested but a basic assumption of the approach. Indeed, it is the major thesis on which its latest incarnation, the embodied mind approach, makes its claim to importance.

Following the pattern of the earlier research which, recall, simply asked speakers to consult their reflective intuitions about the best-example referents of a word, the new paradigm continues to allow conscious intuition to decide exactly which aspects of experience are most natural and therefore most likely to be instantiated in the neurology of every member of our species. These reductionist assumptions are all the more troubling in that even the original method for establishing the existence and nature of focal referents (demonstrating many speakers’ intuitive agreement on the identity of best examples) has degenerated to the point where the analyst’s own intuitions alone virtually always suffice to license the claim that a given referent is the best example for most speakers, and that the requisite cognitive architecture of focal referent, motivated extensional chains, and fuzzy boundaries indeed exists in these speakers’ minds. Despite the explicit and repeated claim that these analyses represent the “cognitive” state of affairs for actual speakers, rather than reified philosophical accounts, the proposed analyses are almost never subjected to empirical verification or scrutiny.

The programmatic assertion that the physical and sensory are the universal and “natural” sources of focal referents in human conceptualization

renders the analyst's solitary task of intuiting which are the focal referents in any given case ever less demanding, and the hypothesis of physiological primacy ever more self-fulfilling.³ In fact, we know that human sensory perception is not sealed off from penetration and modification by cultural learning. And we know this in part precisely because we can document that our conscious intuition about what is "natural" in perceived reality is at times clearly the product of penetration of this kind. The anthropologist Edward Sapir was among the first to explore this territory. He made several brilliant demonstrations of the fact that speech sounds have a psychological, rather than a purely physical, existence for speakers (Sapir 1925, [1933] 1949). In one well-known example, Sapir (1925) pointed out that the sounds represented by the letter *k* in the English words *kill* and *skill* do not have the same physical properties. This can be ascertained by holding the palm of the hand close to the face when pronouncing the two words. In *kill*, the *k* is accompanied by a puff of air; in *skill*, it is not. The fact that English speakers do not hear this physical difference is significant, since in some of the world's languages (e.g., Hindi) it is actually exploited to distinguish among different words. The physical difference is therefore clearly within the range of human perception. The fact that English speakers nevertheless perceive it as inaudible is clear testimony to the fact that the phenomenology of our sensory experience is open to modification by the use of sensory stimuli in culturally organized systems for the making of meaning.⁴

Sapir's observations can today be fitted into a robust corpus of more recent findings that goes by the name of "categorical perception" in cognitive psychology (Harnard 1987).⁵ That corpus tends rather resoundingly to refute the thesis that human perception is immune to and independent of cultural learning. On the contrary, it shows that very often, when apparently imperceptible sensory contrasts are useful in discriminating between all-or-nothing categories that have cultural significance, their ready discrimination is acquired by the experts charged with making the relevant decisions—and the perceptions involved come to seem "natural" and obvious to them. Likewise, humans may lose sensitivity to small but perceptible sensory distinctions that have no cultural function for them, as in the *kill/skill* example.

This happens, exactly as Sapir proposed, in the speech sounds of language (Juszyk 1996) as well as when language is embedded in the visual/spatial modality (Emmorey 1993).⁶ Such effects are also to be observed beyond language—for example, when certain professionals have to decide on the basis of visual inspection whether a particular baby chick, about to be sold for egg production, is in fact female (Biederman and Shiffrar 1987), or when others must say whether a certain blurry shadow in an X-ray photograph means remission or radical surgery (Norman et al. 1992). Uniting

such disparate cases is the common finding that human perceptual intuitions are susceptible to modification in response to the fact of cultural categorization. Taken together, these findings show beyond any doubt that human perceptual understandings are sensitive to the conventions of cultural and linguistic categorization. Any particular speaker's conscious intuitions about what is natural in physical reality cannot be taken at face value for a simple view of the world of culture-free universals.

In another case study from my own work, I now briefly show that a certain strong intuition of perceptual naturalness, shared by most of my readers, is almost certainly culturally and linguistically acquired.⁷ Schoolchildren at about the age of four or five often encounter a particular difficulty as they learn to read and write (Casey 1984). They tend sometimes to reverse their letters, suggesting that the conventional right-left orientation of the letters of the Roman alphabet (e.g., the letter [b] versus the letter [d]) is as yet a matter of indifference to them. They even sometimes adopt a style of writing in which, when the end of one line of left-to-right writing is reached, they continue writing right-to-left on the next line, with all the letters right-left reversed.

However, as time goes by, these children mature, and most of them acquire the orientational conventions necessary to writing and reading English. They come to share the intuition of the adults around them that the inverted forms that they had formerly produced are mistakes. In fact, they come to feel that right-facing and left-facing two-dimensional forms are fundamentally perceptually distinct and that to base critical functional contrasts on them, as we do in the Roman alphabet, is a perfectly natural thing to do.

And they are quite wrong. In fact, it's the other way around. Basing functional contrasts on the difference between right-facing and left-facing two-dimensional figures itself creates the intuition of the "natural" perceptual distinctness of such figures. In learning to read and write in the Roman alphabet, children learn, quite literally, to see the world in a way that they had not done before, and in a way that many adults who do not happen to be literate in the Roman alphabet do not see it.

In work conducted by the Cognitive Anthropology Research Group of the Max Planck Institute for Psycholinguistics, a formal tool for eliciting intuitions about left-right contrasts across language and literacy contexts was designed (see fig. 2). Participants in the study were shown two different plastic cards with simple abstract line drawings printed on them. They were asked to judge whether or not the simpler figure on one card could be found as part of (or "inside") the more complex figure drawn on the other. There were five complex-figure cards (only one is illustrated, in the left column of

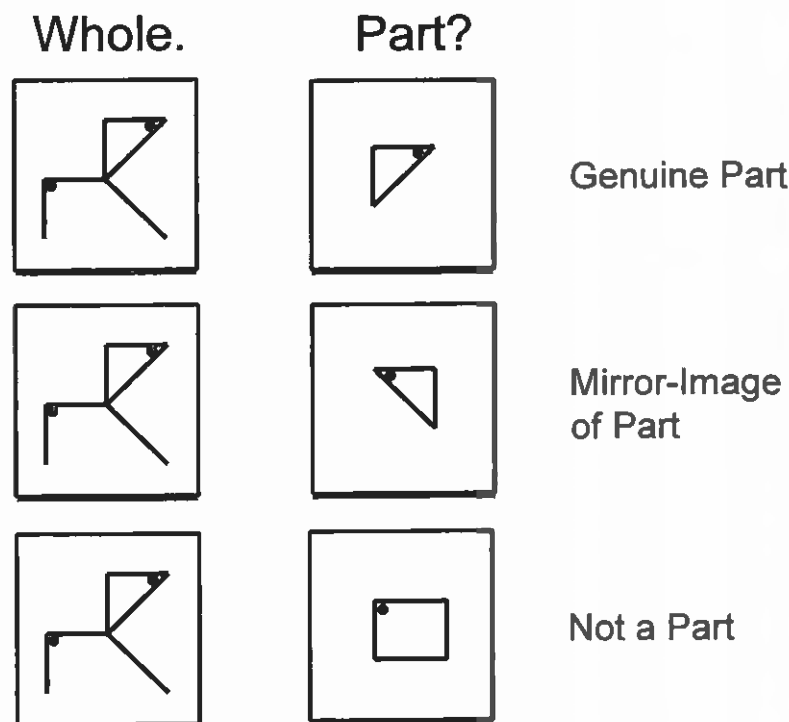


Figure 2. A formal tool for eliciting intuitions about left-right contrasts across language and literacy contexts. (Cognitive Anthropology Research Group, reprinted with permission of Max Planck Institute for Psycholinguistics)

fig. 2), and each was shown three different times, once in conjunction with a genuine part (top pair in fig. 2), once with a clear non-part (bottom pair in fig. 2), and once with a figure that is the left-right mirror image of the true part (middle pair in fig. 2).

Participants were instructed to accept the genuine part and to reject both the clear non-part and the mirror-image part. Note that what is requested is an intuitive perceptual judgment as to the sameness or differentness of mirror-image reflections. Adults in ten different language communities and representing six different language families were asked to complete an expanded version of this formal task.⁸ Both literate and nonliterate adults were represented. Roman-alphabet literates from many cultural backgrounds readily saw mirror-image reflections as distinct from one another, rejecting the mirror-image matches across multiple trials, as per the study's instructions. But if adults were not literate in the Roman alphabet, this sense of the

naturalness of the right-left mirror-image distinction was far from universally present. That is, many nonliterate adults around the world preferred to accept rather than to reject the mirror-image part, even with explicit instructions to the contrary (Levinson and Brown 1994; Danziger and Pederson 1998; Danziger 1999; Pederson 2003).⁹

In short, the perceptual intuition that two-dimensional right-left rotated figures are readily distinguishable—natural as it appears to those of us who hold it—is culturally acquired. In learning to read and write the Roman alphabet, countless children undergo a process of perceptual socialization in which their sensory intuitions come to conform to certain perceptual conventions which have a cultural function in their own—but not in all—societies.¹⁰

Findings such as these make all of our perceptual intuitions highly suspect. They need not augur against the existence of any experiential, conceptual, or linguistic universals at all (see Danziger 2001a for extended discussion), but they do show that first-pass intuitions as to what is “natural” in experience across cultures must be examined very carefully before they are enshrined as such. It is a grave mistake to assume that any given speaker's intuitions about what is natural in perception represent a transparent reflection of universal and noncultural experience. We cannot assume that our perceptual intuitions, no matter how persuasive, are sealed off from cultural penetration, or that they are available as universal inputs to putatively more cultural domains of conceptualization.

The Problem of the Stratigraphic Metaphor

Cognitive linguistics has been instrumental in showing how everyday metaphors inform scientific thinking. The embodied mind paradigm, now emerging from the field of cognitive linguistics, itself shows signs of becoming a prime example. From economic history to child development, reductionism can be found reposing in a recurrent “stratigraphic” metaphor (Geertz 1973: 37). In this metaphor, human life is divided up into a series of qualitatively different units, each consisting of independently organized material and each susceptible to the different modes of analysis characterizing the distinct academic disciplines of the Western tradition (sociology, psychology, or biology, to name but a few). We can see this operating across the intellectual spectrum—from materialist economic models of social life (Marx) to theories of child development that view growth as a matter of biological “unfolding” (Piaget). The model is stratigraphic because the units are conceptualized, like sealed soil strata, as vertical layers, each of which underlies another. With the right tools and techniques, the more “super-

ficial" layers may be successfully stripped off in sequence to reveal the intact lower layers beneath. This metaphor incorporates the assumption that while the lower layers are sealed off from and invulnerable to penetration by the material contained in the layers above them, influence can and does pass upward from underlying to more superficial layers.

A strongly stratigraphic architecture is to be found in the proposals of the embodied mind paradigm. The continuing move toward situating focal referents in universal sensory experience adds the usual stratigraphic content (physical and sensory reality underlies social and conceptual reality) to what was already a clearly stratigraphic form (one sense of any given word conceptually "underlies" the others). Faith in a sealed stratigraphic architecture is also what allows the cognitive linguist to appeal with confidence to his or her own intuitions as to what constitutes "natural" sensory experience. If the lower layers are firmly sealed off from the upper ones, the analyst need have no fear that such intuitions might themselves be the products of local cultural and linguistic practice. A key omission in the embodied mind initiative, then, is its neglect of the effect that linguistic categorization can have on individuals' intuitions about their own experiences, including sensory experiences. This omission arises from a failure to incorporate into the theory the fact that human individuals always encounter languages as social facts which predate the individuals' own existence. As part of this encounter, individuals must sometimes deal with all-or-nothing categorizations—a form of cognitive ordering found in all cultural traditions and not unique to classical philosophy. All language users are therefore vulnerable to the discontinuity illusion, one that can affect even the most-forceful-seeming intuitions about perceptual experience. This makes it impossible to trust individual reflective intuitions for reliable data about the boundary between the natural and the cultural.

Conclusion

In arguing that students of language should not succumb in their analyses to essentialist illusions about a discontinuous reality, and indeed in pointing out the relationship of these illusions to all-or-nothing types of linguistic categorization (classical categorization), cognitive linguistics reopens and advances some of the best ideas in the linguistic anthropology tradition. However, in suggesting that all-or-nothing categorization is merely a scholarly invention and is not actually used by real speakers in everyday life, cognitive linguistics is simply empirically mistaken. Worse, in denying the role played by all-or-nothing categorization in actual speech and in everyday life,

cognitive linguistics denies the significant contribution of linguistic convention itself to the intuitions and experience of any human individual.

As social and symbolic anthropologists have amply documented, and as the Maya kinship example here illustrates, all-or-nothing categorization, complete with accompanying discontinuity illusion, is alive and thriving, far beyond the reach of Aristotelian philosophy. And, as the findings of cognitive psychologists demonstrate, and the mirror-image study exemplifies, cultural and linguistic categories readily impose their structure onto individuals' experience. By relying heavily on analysts' and others' intuitions both about the primacy of physiological experience and about the nature of such experience, the embodied mind paradigm makes itself vulnerable in its own analyses to the very discontinuity illusion that it seeks to deconstruct. As always (Whorf [1940] 1956), it rests with those of us who wish to know more about the nature of our common humanity to proceed by being skeptical of, rather than by relying on, our intuitions of what it is that constitutes the "natural."

Notes

1. My work with the Mopan Maya was supported by the Wenner-Gren Foundation for Anthropological Research and by the Social Sciences and Humanities Research Council of Canada. See Danziger 2001b and Gregory 1984 for more ethnographic detail about the Mopan.

2. The difference in chronological age between the two parties is ostensibly the issue. But decisions are influenced by other questions. Is the new in-law already married? If so, count as "older." Or is he or she still attending school? If so, count as "younger."

3. This empirical slippage has not gone completely unnoticed within the paradigm itself, which does acknowledge in principle the distinction between "phenomenological" (i.e., consciously intuited) and other cognitive levels of embodiment (Lakoff and Johnson 1999: 102–3). But the practical application of such a distinction would require a more skeptical attitude toward the use of intuition in analysis than is actually to be observed. Even those few cognitive linguists (e.g., Sandra and Rice 1995) who valiantly endeavor to reintroduce empirical accountability into the paradigm do not leave the domain of conscious intuition. Instead, their response takes the form of a return to asking large numbers of speakers for their intuitions about best-example referents (see also Lyons 1986 for critical discussion of introspection as a method in cognitive research).

4. For an example of the opposite effect (illusion of physical difference where there is none), read the following two phrases out loud, as they are written, to a native speaker of English. Does your listener feel that the middle word in phrase *a* rhymes with the middle word in phrase *b*?

(a) The *firs*' example

(b) The *verse* example

Despite the fact that the words *firs*' and *verse* end with the same physical sound, many English speakers have a strong feeling that the words do not rhyme, since *firs*' is actually an abbreviated

form of *first*. This is an auditory illusion, revealing that *firs'* and *first* are perceived by English speakers as members of a single meaningful category and not merely as brute sensory stimuli (this example is calqued from example II, Sarcee, in Sapir [1933] 1949: 52–54).

5. I am grateful to Robert Goldstone for drawing my attention to this body of scholarship.

6. Notably, categorical perception effects have also been documented as a function of language-particular color classifications (Kay and Kempton 1984; see also Goldstone 1995).

7. The research was supported by the Cognitive Anthropology Research Group of the Max Planck Institute for Psycholinguistics. It was inspired by the work of Arlette Verhaeghe and Régine Kolinsky (1991) and informed by that of Stephen Palmer (1977). The experimental design was finalized by Stephen Levinson and Bernadette Schmidt. The Max Planck Institute for Psycholinguistics holds the copyright for figure 2, which is reprinted here with permission.

8. Data were collected by Penelope Brown (Tzeltal Maya), Eve Danziger (Mopan Maya), Deborah Hill (Longgu), Kyoko Inoue (Japanese), Elizabeth Keating (Pohnpeian), Steven Levinson (Tzeltal Maya), Paulette Levy (Totonac), Ester Messing (Dutch), Eric Pederson (Tamil), Gunter Senft (Kilivila), and Christel Stolz (Yucatec Maya). For fuller details see Danziger and Pederson 1998.

9. Intriguing findings by Kolinsky, Morais, and Verhaeghe (1994) show that the neurology involved in the brute perception of this sort of figure is similar across literate and nonliterate individuals; this is irrelevant to the same individuals' intuitions about what they are "naturally" perceiving.

10. Other research has also shown that even among those who participate in the intuition that lateral rotation of arrangements in space makes a difference, the experience of that intuition is culturally variable. In many cultures such rotation is neither described nor experienced as "right-left" inversion but as inversion in the relationship of figures to the surrounding landscape (something like "north-south" or "inland-seaward" inversion). See Pederson et al. 1998 for details.

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