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Language, culture and cognition:
The view from space[1]

Abstract
This paper addresses the vexed questions of how language relates to culture, and what kind of notion of culture is important for linguistic explanation. I first sketch five perspectives - five different construals - of culture apparent in linguistics and in cognitive science more generally. These are: (i) culture as ethno-linguistic group, (ii) culture as a mental module, (iii) culture as knowledge, (iv) culture as context, and (v) culture as a process emergent in interaction. I then present my own work on spatial language and cognition in a Mayan languge and culture, to explain why I believe a concept of culture is important for linguistics. I argue for a core role for cultural explanation in two domains: in analysing the semantics of words embedded in cultural practices which color their meanings (in this case, spatial frames of reference), and in characterizing thematic and functional links across different domains in the social and semiotic life of a particular group of people.

0. Introduction

Language is the pre-eminent cultural property of humans and a prerequisite for the rest of (human-style) culture, while at the same time being the property that has been taken by many to be the most self-contained, most dissociable from the rest of culture. This paper provides a linguistic anthropologist's perspective on what this means for the study of language – how does language relate to culture, what kinds of cultural explanation need to be evoked to explain linguistic structures and processes? One difficulty imme-

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1   A longer version of this paper, addressed to an anthropological audience, was originally published as 'Language as a model for culture: Lessons from the cognitive sciences' by Penelope Brown in the book *Anthropology Beyond Culture* (2002, Eds Richard G. Fox and Barbara J. King) by Berg Publishers (Oxford-New York) www.bergpublishers.com

diately arises: 'culture' itself is not an unproblematic notion – anthropolo-
gists have been quarrelling about its meaning for half a century (see, for
example, Sperber 1996; Kuper 1999; compare Kroeber and Kluckhohn 1952),
and recently proposals for abandoning the whole concept of culture have
gained ground (Fox and King 2002). Similarly, there seem to be as many
notions of culture invoked in linguistics as there are theoretical approaches
to language, so answering the question – what kind of notion of culture is
important for linguistic explanation? – requires an assessment of the con-
strual of culture in linguistics, and in cognitive science more generally.

Therefore, I begin by characterizing five distinct perspectives on culture
that arise in the language sciences. I sketch the range of presuppositions
about culture amongst this diverse set of theorists and then present my own
work on spatial language and cognition to explain why, in my view, a con-
cept of culture is important for linguistics. Laying my cards on the table at
the outset, I see the need for a concept of culture in two domains: (i) to ana-
lyze the semantics of words embedded in cultural practices which color their
meanings, and (ii) to talk about thematic and functional links across different
domains in the social/semiotic life of a particular group of people. Mine are
unfashionably functionalist arguments, for a degree of symbolic unity across
the parts and of functional dovetailing of parts across domains. It is these
connections, I shall argue, which in many detailed ways help children to
learn language and to a significant degree through language use to learn cul-
ture.

My interest in addressing cognitive scientists' concepts of culture arises
from my preoccupation with a problem at the intersection of the disciplines
of anthropology, linguistics, and psychology: how to account for the distinc-
tive cognitive style of a group of Mayan Indians. The problem that I wrestle
with concerns spatial language and cognition across languages and cultures.
My corner of this problem lies in the Mayan community of Tenejapa, in
southern Mexico.[2] Here we find a distinctive linguistic repertoire for talking
about spatial relations, a distinctive frame of reference for calculating them
– based on the overall uphill/downhill slope of the land – and a distinctive
cognitive style associated with these that consists of ways of thinking about,
talking about, remembering, and reasoning about space that are in crucial
respects different from those found in many other societies. Here people
routinely reckon spatial relations in relation to the overall slope of the land,
on both large and small scales, for example, describing the spatial relation

2   This research was conducted in the Mayan municipio of Tenejapa from 1990 to 1995, in
    collaboration with Stephen Levinson, and is based also on fieldwork by myself
    (1971 – 1973, 1980, and 1996 to the present) in the same community. The Tzeltal data dis-
    cussed here are derived from participant observation, videotaped natural interaction,
    videotaped interactional 'space games' constructed to foster the use of spatial vocabulary,
    linguistic elicitation, and informal cognitive experiments. See Brown (2001) for details.

between a bottle and a rope by saying things like 'The rope is downhill-wards of the bottle', or requesting an object by saying 'Give me the machete uphillwards of the door'. Adults are absolutely oriented at all times (amounting effectively to always knowing where north is). Their gestures and pointing are absolutely oriented in relation to physical places, and their ritual life is organized into 'uphill' and 'downhill' ceremonial sectors. There is a complete absence of linguistic left/right distinctions in spatial description, with a corresponding left/right symmetry in household layout, artifact design, and weaving patterns. And critically, people talk about and remember spatial arrays, whether in large-scale (geographic) or in small-scale (tabletop) space, in an absolutely oriented fashion.

In short, in this community there is an acquired way of thinking – a distinctive cognitive style – for talking and thinking about space. The everyday taken-for-granted nature of this non-egocentric spatial system flies in the face of the claims in cognitive science that the universal basis for spatial language and thinking lies in our common human egocentric visual system, which strongly constrains how we can think about space. And, in many respects, the contexts for learning and using the linguistic system at the heart of this style do not correspond to what has been presumed universally necessary for children to learn a language.

Now I am convinced that I need a notion of culture (including the culture-specific details of the language) to explain how children come to acquire this quintessentially cultural way of thinking. More generally, I believe that culture – despite the current resistence to this idea in the cognitive sciences – has much to do with the processes of language acquisition, and the socialization through language of the distinctive cognitive and ideological habits that are characteristic of members of this community.

BUT: culture *in what sense?*

1. The view from linguistics and cognitive science

1.1. Five stances towards 'culture'

Linguistic scholars, like people everywhere, tend to see the world through the lens of what they know about; hence language tends to be taken as the model for how culture is to be construed. There are radically different views of culture, and of the role of culture in explanations, depending on which kind of linguistic theory one adheres to. Many linguists, to be sure, ignore culture altogether; it is not considered relevant to their field of operations. For those who do invoke culture, we can identify five broadly-characterizable 'ideal-type' notions of culture. These are distinguished ac-

cording to the degree to which, and in what sense, culture is taken to be relevant to the object of study and in particular, to the views of their proponents concerning the nature of language, of meaning, and of mind.

Stance 1: Culture as ethnic or linguistic group

The first stance takes culture to be a shorthand way of referring to social groups who share a language. Most of us employ this concept of culture some of the time (talking of culture X vs. culture Y), but for many linguists of a typological/comparative persuasion, this is the only concept of culture at hand. People who share a language are taken to be members of a social group, with social barriers to communication across groups, and with their boundaries subject to historical change; 'culture' is used in an unexamined way to equate with such groups. For some, the uniqueness of the language amounts to the same as the uniqueness of the culture, which is considered irretrievably lost if the language is lost. Mind is not for the most part an explicit focus of interest (except when features of mind are presumed to explain universals). Grammatical meaning is seen as based on a universal repertoire of distinctions (e.g., tense, aspect, person), although lexical meaning is usually seen as culture-specific, varying with the language or the language type.

In addition to the political sensitivity of this 'culture-equals-language-group' stance – implying, as it does, that, for example, an English-speaking Australian Aboriginal is no longer an Aboriginal – it is sociolinguistically naïve. There simply is no one-to-one mapping of language and social group; instead, social networks, corporate groups, and language interdigitate in very complex ways. In fact the concept of language is as problematic as that of culture (in terms of boundedness, holism, etc.) Language typologists do acknowledge certain phenomena which undermine their language-equals-cultural-group stance: for example, they recognize 'language areas' where there is structural influence across unrelated languages in an inter-communicating area (as in India and in Mesoamerica). To the extent that they try to account for such areal patterns, it is by invoking a 'traits' explanation: a set of linguistic traits (e.g., particular grammatical morphemes) diffuse, due to a particular set of cultural traits (e.g., trade, political dominance, intermarriage).

Stance 2: Culture as a mental module

A second stance has a different view of language and correspondingly different model for culture. In this stance, founded in Chomsky's generative school of linguistics, culture – if considered at all – is construed by analogy to language in a very special sense. The distinctive property of language is taken to be syntax; the abstract core of syntax (Universal Grammar, or UG)

is a mental module which is universal and biologically innate. Syntax is taken to be autonomous from meaning, and meaning is seen as being parasitic on a universal human conceptual structure which is also taken to be innate.

Several theorists have explicitly applied this model to culture. The psycholinguist Steven Pinker, the great popularizer of this stance (Pinker 1994, 1997), states quite bluntly that all the interesting properties of language are universal and are innately specified in our genes, down to the details of UG (phrase structure, nouns and verbs, subjects, case, etc.). Any differences are trivial variations on this fundamental structure (Pinker 1994: 18–19).

He takes the same line towards the rest of culture:

> At first glance, the ethnographic record seems to offer a stark contrast [to UG]. Anthropology in this century has taken us through a mind-broadening fairground of human diversity. But might this carnival of taboos, kinship systems, shamanry, and all the rest be as superficial as the difference between *dog* and *hundt* [sic!], hiding a universal human nature? (Pinker 1994: 411)

The argument for the universality of culture and and its genetic basis is developed at length in Pinker (1997), based essentially on the ideas of evolutionary psychologists such as Tooby and Cosmides. Here Pinker extends the image of mental modules to include a module for culture (Pinker 1997: 21). Again, his use of the culture concept is solely to make claims about the set of traits that all humans, or all human subgroups of a certain type (namely, "foragers") share. For example:

> All human cultures ever documented have words for the elements of space, time, motion, speed, mental states, tools, flora, fauna, and weather, and logical connectives .... They combine the words into sentences and use the underlying propositions to reason about invisible entities like diseases, meterological forces, and absent animals. Mental maps represent the locations of thousands of noteworthy sites, and mental calendars represent nested cycles of weather, animal migration, and the life histories of plants. ... All foraging peoples manufacture cutters, pounders, containers, cordage, nets, baskets, levers, and spears and other weapons.... (Pinker 1997: 189)

Here is depicted a caricature of a generalized forager, characterized by a universal set of traits. The only role for cultural difference is as the historical accretion of expertise:

> ... an information-exploiting lifestyle goes well with living in groups and pooling expertise - that is, with culture. Cultures differ from one another because they pool bodies of expertise fashioned in different times and places. (Pinker 1997: 190)

I've used Pinker to illustrate Stance 2 because his claims have had a very wide press. But, hard to believe though it may be, this stance is perhaps the mainstream one in cognitive science, taken uncritically from the mainstream

linguistics of the past 40 years and extended from language to culture by theorists influenced by evolutionary psychologists. Although the view of language as an innately specified mental module has certainly not gone un-challenged,[3] in the work of many other cognitive-science-oriented theorists we can find arguments for what is universal and what is innate in humans along very similar lines to those of Pinker. Take, for example, Ray Jackend-off, whose picture of culture focusses on how children learn concepts. Like Pinker, Jackendoff presumes that there is a universal conceptual structure with innately-given concepts and rules for restricting possible concepts. In order for children to learn word meanings, Jackendoff (1992) argues, they must have a set of primitives with specific content (e. g., spatial concepts, the concept of possession); such concepts must be pre-given in the child's Con-ceptual Well-formedness Rules (Jackendoff's proposal for a mental module that sets the limits for possible concepts). Thus not only the ability to form concepts but the content of some concepts – the 'primitives' from which concepts are built – must be innately given.

Jackendoff (1992: 69) also argues for "a module or group of modules (a faculty) that is specialized for *social cognition*"; this is what enables children to learn culture. Foreshadowing Pinker (1994), Jackendoff (1992: 74) observes that despite the considerable variation both across cultures and within a culture, "following the example of language, perhaps we should be looking for underlying principles that enable a child to learn the culture-specific conventions in which he or she is situated." Many such underlying princi-ples have been proposed in the child developmental literature, including hypotheses about the necessary cognitive prerequisites for learning language in general, and for learning particular aspects of language (e. g. nouns as opposed to verbs).[4] In the grip of the computational metaphor for human thinking, these proposals show a certain lack of imagination about how context and creative inference can fill in the gaps for human learners who (unlike computers) grow up in a matrix of a rich community of practices which inform the use of language.

Jackendoff winds up with an explicit analogy between Culture and Lan-guage in the form of Chomsky's Internal (I-language) (competence, as op-posed to E(xternal)-language which is performance),:

> The hope... is that many of the Universals and parameters of human E-[external] social organization can be eventually attributed to the character of I-[internal] social organization, just as many properties of human linguistic commmunica-

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3   See, for example, Tomasello's damning review of Pinker's *The Language Instinct*, entitled "Language is not an instinct", as well as Elman et al. (1996), Deacon (1997), Sampson (1999).

4   See for example, the 'lexical principles' proposed in Golinkoff et al. (1995).

tion have been attributed to the mental capacity that constitutes I-[Internal] language. (Jackendoff 1992: 76)

His detailed proposal for these universals include some primitives of social cognition: persons, requests vs. orders (which rely on a social dominance hierarchy), exchange transactions (which rely on social concepts of agreement, value), ownership.

What then is left to be learned? Not a lot, according to Jackendoff:

> The child only has to learn what parameters govern ownership or property rights in the local culture. The codification of these parameters (and those connected to kinship, etc.) constitute the basic issues around which a culture constructs its equivalent of a legal system. (Jackendoff 1992: 79)

> Learning a culture then consists of fleshing out the particulars of these frames into a culture-particular realization, and creating categories of situations in which to apply the logic of each mode of interaction. (Jackendoff 1992: 80)

In other words, an innately specified social cognition module provides the underpinnings – including the relevant concepts – for 'learning a culture'.

In sum, cognitive scientists like Pinker and Jackendoff insist that you have to think about culture just like generativists think about language, as a genetically specified set of underlying elements with underlying rules of combination. They postulate the existence of universal abstract traits of Culture analogous to those of Language, while redirecting attention to the mental underpinnings of Culture; from this perspective the differences between cultures are trivial.

We can give these cognitive scientists credit at least for asking the question that anthropologists have generally failed to ask[5] – how is it that humans can have culture? – and for proposing an answer: Because human minds are different from those of other animals! This idea has been irresistably attractive not only to cognitive and developmental psychologists but also to many cognitive anthropologists. However, such proposals fail to recognize that it is by no means straightforward to establish what the cognitive primitives underlying all social life actually are. Everyone would agree that biology places some constraints on human minds, culture, and behavior. But exactly *what* these constraints are is precisely the issue that should be (and, on the whole, is not) empirically addressed. The Pinker/Jackendoff claims for the innate component are entirely too detailed and theory-dependent in relation to the evidence assembled. In fact, all the universalists who take Stance 2 are painfully naïve about the extent and significance of cultural and linguistic variation.

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5   An exception is Carrithers (1992). Biological anthropologists, too, increasingly are asking these questions (see Durham 1991).

Turning now to sociological and anthropological approaches to language, we can see that different ideas about the nature of language induce different extrapolations to the nature of culture.

Stance 3: Culture as knowledge

A third stance treats cultural differences as worthy of investigation, but assumes that they are best seen through a language's semantic categories. Language again is the key to culture, but language as semantics rather than as UG. This is of course the view promulgated in classic ethnoscience, as in Goodenough's famous (1957) statement:

> ...a society's culture consists of 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. Culture, being what people have to learn as distinct from their biological heritage, must consist of the end product of learning: knowledge, in a most general, if relative, sense of the term. (Goodenough 1957)

Like Stance 2, this 'culture-equals-knowledge' stance is also based in a linguistic homology (Duranti 1997: 27): knowing a culture is like knowing a language, both are mental realities, and describing a culture is like describing a language: you write 'cultural grammars'.

Modern proponents of this view range from cognitive linguists (e. g. Langacker 1986), to practitioners of some schools of semantics (e. g. Wierzbicka 1992), to modern descendents of ethnoscience or cognitive anthropology (D'Andrade 1995, Strauss and Quinn 1999). In terms of their views of mind, this group is as cognitivist as the generativists – mind is where the action is. Meaning inheres in individual minds, but is structured by culturally learned experiences which provide 'frames', or 'schemata' for organizing and understanding cultural ideas. Culture consists of the content of such schemata. However, the cultural notions invoked are often very crude; for example Talmy's (2000) idea of a cognitive culture module is analogous to that of Pinker.

From this third perspective the mind is taken to be rather hodgepodge, for the schemata – the units of culture in the mind – are not necessarily integrated with each other. In fact "[t]he overall view is one in which culture is seen to be particulate, socially distributed, variably internalized, and variably embodied in external forms" (D'Andrade 1995: 248). This insistence on the heterogeneity and non-integration of different aspects of cultural knowledge has the virtue of providing an antidote to over-holistic views of culture. However, it ignores the fact that some core aspects of cognition (for example, space), are demonstrably culturally conditioned and yet they *cross-cut* different mental domains.

Stance 4: Culture as context, the envelope for linguistic practice

A fourth stance, associated with the ethnography of speaking, takes culture to be the basis for the contextually-specific nature of language as it is actually used. Culture is whatever makes us use language differentially in different contexts, with contexts taken to be characterizable in terms of social variables like gender, age, ethnic group, genre, social setting, etc. This approach was characterized by Hymes in the 1960s as follows:

> Hymes introduced the notion of speech events as central to the ethnography of speaking; he argued that analysis of speech events required study of the interrelationships among a number of factors – basically settings (times and places for events), participants (possible and actual addressers, addressees, and audience), purposes (functions and goals of events), linguistic varieties and styles, verbal organization in terms of constituent speech acts, modes and manners of delivery or performance, norms of interction, and speech genres. The careful study of components of speaking with regard to both terminology and patterned organization, as well as of the relationship between these components and the functions of speech, leads to a description that captures each society's unique cultural organization of language and speech. (Sherzer 1983: 11 – 12)

This perspective relates to a loosely connected family of approaches, crossing disciplinary boundaries from much of linguistic pragmatics, across hypenated branches of linguistics interested in the social setting of language use for adults, or of children learning language. This includes sociolinguistics, traditional anthropological linguistics and the ethnography of speaking (e. g., Bauman and Sherzer 1974, Hardman 1981, Sherzer 1983, Coates 1998, Senft in press), as well as some brands of social and developmental psychology (e. g., Giles and Scherer 1979, Blum-Kulka and Snow 2002, Ervin-Tripp and Mitchell-Kernan 1977, Snow and Ferguson 1977, Ervin-Tripp 1996). For these scholars, analysis centers on activities, the interactions in which activities are embedded, how such activities structure the environment and the frameworks for understanding within which language is used and learned, as well as how this can give rise to miscommunication in cross-cultural interaction. In this stance, it is the cultural contexts that are actually a focus of study; contexts, for example, like the classroom, the courtroom, the workplace, or contexts like those that constrain code-switching. On the whole, the nature of mind is not explicitly of interest. The nature of language and the construal of meaning in this stance contrasts radically with those whose views were described above: language is situated in use, and communicative competence is the object of study. Some universals have been suggested (for example Hymes' [1974] proposal for the dimensions of context relevant to linguistic variation), but the emphasis here is on differences.

Stance 5: Culture as process, emergent in interaction

This stance has emerged in the past 30 years in the subdisciplines of linguistics, anthropology, and psychology that study naturally-occurring interactional behavior in its cultural setting.[6] Here we have the insistence that culture is *both* knowledge and habits of thinking, on the one hand, *and* out-there-in-the-world as objects, interactions, communicative behaviors, on the other. In this supraindividual sense it forms the environment – of people, objects, and altered landscapes – that children are born into, and which scaffolds their interactions so as to ensure that, within the constraints of their biological endowment, they gradually become enculturated members of the society.

While there are many differences among theorists who take Stance 5, they all stress the emergent nature of mind, of meaning, and of culture; these emerge in the process of social interaction, relying both on cultural props in the environment and on other minds. They also share a conviction that to understand this emergent meaning/mind/culture you must study the emergent process, by looking at data drawn from real situationally embedded social interactions.

Culture, according to this stance, is partly in the mind, partly (re-)created in social interaction. Proponents include practice theorists such as Suchman (1987) and Lave (1988), who argue that cognition is instantiated in action, in everyday practices; as such it is "distributed – stretched over, not divided – among mind, body, activity and culturally organized settings (which include other actors)" (Lave 1988: 1). Much cognition occurs *between* individuals, emerging from their interaction (Hutchins 1995). Linguistic anthropologists argue in addition that knowledge resides also in the tools people use (Keller and Keller 1996); culture as knowledge must include culture as objects.

Other proponents of this approach to culture are the modern interactionist linguistic anthropologists who take Bourdieu as a source of inspiration: e. g., Duranti (1997), Hanks (1995), Gumperz (1992), Foley (1998). Work on language socialization (Ochs 1988, Schieffelin 1990, Ochs and Schieffelin 1990, Goodwin 1990) also fits into this perspective.

Another group who take Stance 5 are the proponents of a newly conceptualized Whorfianism (Lucy 1992a,b, Gumperz and Levinson 1996), committed to the comparative study of thought as constrained by language, without treating thought and language as static global entities but rather linking the language/thought relationship in a particular domain to on-line processing, habits, and patterns of interaction. These studies of linguistic relativity with an explicitly comparative methodology are tied to crosslin-

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6   It rests on earlier pioneering work from the 1960s and 1970s, especially that of ethnomethodologists and conversation analysts, as well as interactionist psychologists like Roger Brown and Jerome Bruner.

guistic studies of language acquisition conducted from the perspective of
Stance 5 (for example, Slobin 1996, Bowerman 1996, Bowerman and Levinson 2001). These have formed a distinct line of research which converges in
one respect with that described under Stance 3, namely in the serious attention to findings in cognitive science about how the human mind works, and
a commitment to contributing an anthropological, comparative perspective
to the cognitive science enterprise. This work reflects a recent swing back in
psychology, linguistics, and linguistic anthropology towards a position that
views diversity in linguistic and cultural practice *within* what has been learned
about universals.

1.2. Summary

Cognitive science is the modern setting for the old debate concerning the
psychic unity of mankind. The five stances towards culture I have sketched
above characterize different positions in the debate, each with its own limitations. Lurking underneath these stances are more fundamental ideological
divisions, polar oppositions found in anthropology just as much as in linguistics, which are the source of the chronic cross-talk between universalists
and relativists, with their different presuppositions. The oppositions include
Culture with a capital C vs. specific cultures, culture as a (partially) integrated whole vs. a set of diverse traits, culture as mental vs. material. But
proponents of Stance 5 argue for an integration of these poles: culture as the
mental and physical environment in which meanings arise in situated interaction with others, and in which a child turns into a member of a cultural
group.[7]

   As Lucy (1996: 39) has pointed out, one's stance towards the importance
of variation in language and culture depends greatly on one's view of the
significance of having a language at all, as opposed to not having one. The
dominant perspective in cognitive science stresses the continuity between
humans and other animals, and views language as a biological phenomenon
that maps in an unproblematical way to perception, cognition, emotion,
social interaction. Humans, in this view, are unique in occupying "the cognitive niche" (Pinker 1997), to which language is a relatively straightforward
addendum. The alternative view holds that, despite many continuities, humans differ fundamentally from other animals due to the fact that humans
alone possess a variable symbolic capacity which adds new levels of organization (self, culture, consciousness, historically developed systems of meaning), all of which depend on human language. This view insists that humans
also occupy 'the cultural niche', and cultural niches vary (Deacon 1997,

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7   See, for example, Tomasello (1999) and the papers in Bowerman and Levinson (2001).

Levinson 1998, 2000, Tomasello 1999). Indeed it is culture's amenableness to variation that may be the key to the uniqueness of this human-occupied niche.

Given these kinds of profound divisions in interests and presuppositions, is there a concept of culture that could usefully feed into linguistics and cognitive science more generally? The cognitive scientists I've discussed above are floundering to include culture in their grand picture while operating with exceedingly primitive concepts of culture. It's time to start building explicit models and cross-disciplinary research programs for investigating the *interaction* of culture (as socially learned meanings and behavior patterns) with language, and with mind. I will describe one such program, coming back to consider my Tenejapan problem of spatial language and cognitive style.

2. How can we study language-in-culture comparatively?

Over the past fifteen years an empirical comparative program has been developed by Stephen Levinson and his collaborators at the Max Planck Institute for Psycholinguistics, which aims to contribute directly to the cognitive science enterprise. Against a background of universal constraints (which need to be discovered, not stipulated), the aim is to establish dimensions of cognitive variability, looking at particular domains – like space – which are fundamental to thought while forming part of the taken-for-granted background of everyday life. Culture as 'public representations' exists both in our minds and in the environment, and comes into individual minds through social interaction. This notion of culture is more particulate than the anthropologists' "group with its own lifestyle and value system", but less hodge-podge than D'Andrade's "tidal pool". Cultural ideas are considered within a particular domain, in this case the domain of spatial language and spatial thinking across cultures. They are also considered in a community of practice, as actually used by members, not just as reported by them.

Space is basic to human life, involving much taken-for-granted knowledge and invoked in many everyday activities: reckoning where one is, one's internalized geographical map, navigating and route finding, giving route directions, indicating where to find things one is looking for, tracking locations and travels in a narrative, spatial reasoning, and much more. There is much controversy over the respects in which spatial language and thinking are universal (as assumed in most cognitive science), to what extent they can vary cross-linguistically, cross-culturally, and whether variations in spatial language can influence spatial thinking.

The standard line in philosophy, psychology, and cognitive science has presumed a universal basis for spatial cognition in the biological structures

that we have as mammals. The dominant view is that an egocentric perspective is fundamental to human spatial thinking: three planes through the body provide the basis for thinking in terms of space 'in front'/'behind', to the 'left'/'right', and 'above'/'below'.[8] This view seems to be supported by (i) modularity in the brain (distinct 'what' vs. 'where' systems) and (ii) certain linguistic evidence, for example of how children acquire spatial prepositions in Indo-European languages. The conclusion had overhastily been drawn from these kinds of evidence that the universal basis for spatial language resides in our common human egocentric visual system and strongly constrains how we can think about space.

However, findings from our large comparative study of spatial language and cognition cast doubt on the universality of egocentric space as the basis for linguistic systems of spatial description. Spatial linguistic systems around the world are actually much more variable than has been presumed (Levinson 1996a,b,c, 2003). In particular, they differ systematically in their underlying *frames of reference* (their coordinate systems for reckoning spatial relations on the horizontal).[9] Three major frames of reference are used in languages of the world to calculate spatial relations in small-scale (local) space; only one of these is egocentric. The three basic frames of reference are (i) *'Relative'*, using the speaker's egocentric viewpoint to calculate spatial relations, as in the familiar 'left'/'right'/'front'/'back' systems of European languages (e. g., "The boy is to the left of the tree (from speaker's viewpoint)", (ii) *'Absolute'*, using fixed bearings extrinsic to the objects whose spatial relation is being described, like the cardinal direction systems of many Australian Aboriginal languages (e. g., "The boy is north of the tree"), and (iii) *'Intrinsic'*, relying on intrinsic properties of objects being spatially related (e. g., parts and shapes of the Ground object, positions of the Figure object[10]) to reckon spatial relations, as in the bodypart systems ('top', 'bottom', 'side', 'middle', etc.) of many languages (e. g., "The boy is at the rear of the car").

These three frames of reference are made use of differently in different societies. First, not all languages use all three systems, and there are different default systems for spatial language across cultures. Western speakers of

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8   See, e. g., Clark (1973), Miller and Johnson-Laird (1976).

9   I'm restricting myself to spatial relations on the horizontal because on the vertical there is a multiplicity of cues (especially those due to gravity) which provide a plausibly universal basis for assessing spatial relations on the vertical axis. I am also restricting the discussion to language used to specify *precise angles* (directions) on the horizontal (using words that gloss as 'left/right', 'front/back', 'north/south/east/west', 'uphill/downhill/across', 'seawards'/'landwards', 'upwind/downwind', etc.). Deictic expressions that just indicate relative distance from the speaker (e. g. 'here'/'there', 'this'/'that'), without indicating a specific direction, are not included here. (See Levinson 2003: ch. 2).

10   The terms Figure and Ground in discussions of spatial language derive from the gestalt psychology terms; they refer to the object being located (the Figure) and the object or region in relation to which is is located (the Ground). See Talmy (1983, 2000).

English use mainly Relative and Intrinsic systems, using Absolute only for large-scale geographic reckoning (between, e. g., two cities). But speakers of the Australian Aboriginal language Guugu Yimithirr use only one frame of reference, an Absolute North/South/East/West system, and Tzeltal speakers use only two: an Absolute ('uphill'/'downhill'/'across' the overall slope of the land downwards to the north) and an Intrinsic (body part) system. Secondly, spatial description in different languages and cultural settings may have different default frames of reference for particular purposes (small-scale vs. long-distance, for example). Thirdly, cognition is related to the default systems. These different frames of reference have different conceptual bases (egocentric, geographically-centered, or object-centered), resulting in different implications for spatial memory and reasoning.[11] They also differ in cognitive complexity.[12] And a second major finding from the Max Planck project is that there is a clear link between what linguistic system is used and non-linguistic spatial cognition. Results on a range of nonlinguistic tasks carried out in over ten unrelated languages and social groups show that people think, remember, and reason in the system they use most for speaking with (Levinson 1997, 1998, 2003, Pederson et al. 1998). This is then a prime example of a Whorfian link between language and non-linguistic cognition.

To illustrate, let's come back to the case we started with – the Mayan Tzeltal-speakers of Tenejapa in southern Mexico. In this community, set in precipitous mountain terrain, the main spatial frame of reference is in terms of 'uphill' and 'downhill'. Using an abstract conceptual angle based on the overall slope of the land downwards from south to north, Tzeltal people routinely describe motion as 'ascending' (i. e., going southwards) / 'descending' (going northwards) / 'going across' (going east- or westwards), and they describe objects as being 'uphill' or 'downhill' or 'acrossways' in relation to another object. They do this both on sloping and on completely flat terrain, and in small-scale (e. g. table-top) space as well as over long distances (Brown and Levinson 1993a,b, Levinson and Brown 1994). Correlated with this Absolute linguistic system is the fact that on non-linguistic tasks of memory and reasoning Tzeltal speakers have a strong tendency to code in Absolute terms, in contrast to Dutch speakers who code in Relative 'left'/'right'/

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11 Among such implications are differences in performance on memory tasks. People shown a spatial layout and asked to remember it, then rotated 180 degrees before having to reconstruct it, will perform differently depending on their frame of reference. Relative speakers rotate the spatial scene so that what was on the left side remains on the left; Absolute speakers rotate the remembered array in their heads and reconstruct the array with the same object lying to the North (say). See Pederson et al. (1998), Levinson (1996b, 2003).

12 Complexity clearly is different for the two-place topological relations of an Intrinsic system (e. g., 'at the house's face'), three-place egocentric relations for Relative (e. g., 'left of the house'), three- or four-place Euclidean grid for Absolute (e. g. 'north of the house'). See Levinson (1996b).

'front'/'back' terms (Brown and Levinson 1993a, Levinson 1996b, 2003). To achieve this behavioral consistency, Tzeltal speakers must have a cognitive habit of constant background tracking of where abstract 'uphill' (south) is. Other cultural features of this Mayan society reflect the absence of left/right distinctions and reinforce the cognitive effects of the Absolute frame of reference: for example, there is a strong preference for left-right symmetry in cultural artifacts and activities (weaving, architecture, ritual). There is also evidence that people are to some degree 'mirror-image blind',[13] a result consonant with the fact that these are people who speak a language with no left/right distinction and have not (yet) been forced by literacy, or automobiles, to attend to left/right distinctions.

How do people come to share a cognitive style with respect to space? How do children learn to think differently depending on what spatial reference system they learn? The mainstream (Piagetian) view is that cognitive development proceeds through universal stages, uninfluenced by the linguistic categories of a particular language; cognitive development precedes, and lays the basis for, linguistic development (Piaget and Inhelder 1967, Laurendeau and Pinard 1970). But a third finding from work at the Max Planck Institute for Psycholinguistics is that children are very early attuned to the particularities of the semantic spatial categories that their language uses (e. g., Bowerman 1996, 2000), and, in line with this finding, there appears to be cultural variation in how children learn their spatial linguistic system. Evidence from my longitudinal study of Tzeltal children indicates that children learn the Absolute system relatively early, having productive mastery of the complex sets of semantic oppositions by age three and a half, and the ability to use the system in novel situations on flat table-top space by between age 5 1/2 to 7 1/2.[14] In addition, children seem to learn the Absolute system – the 'projective' and therefore cognitively more difficult one – as soon as, or possibly even before, they master their Intrinsic 'topological' system, at least as suggested by their linguistic production (Brown 2001, Brown and Levinson 2000).[15]

These findings, and others – including the fact that Tzeltal children of 18 months start talking with verbs, many of them semantically- (and culturally-) specific verbs – suggests that language itself can influence the concepts children develop, during their semantic learning (Brown 1998a,b). These

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13 For example, on a task requiring discrimination between two otherwise identical but mirror-image reversed photographs, Tzeltal speakers routinely insist that "they are exactly the same" (Levinson and Brown 1994).

14 This compares very favorably with western children's mastery of the left/right distinction, which isn't complete till age 11 or 12 (Brown and Levinson 2000).

15 Similar findings are described in de León (1994) for the closely related Mayan language Tzotzil. Related work in Bali (Wassman and Dasan 1998) and in India and Nepal (Mishra, Dasen and Niraula 2003) has also shown early learning of an Absolute spatial system.

children are also sensitive to the semantic structure of their language as re-
vealed in patterns of ellipsis (what is assumed to be known in the context)
(Brown, in press). More speculatively, certain properties of the language
they are learning may influence their cognitive development; it is suggestive
that Tzeltal children have their Absolute linguistic system quite early, as
soon as or even before the Intrinsic system, contrary to what we would
expect on the basis of Piaget's claim that topological concepts are always
learned before Euclidean ones (Brown and Levinson 2000). It is also of inter-
est that these children very early (from around age 3) use and recognize con-
ventional irony as well as lying, raising the provocative possibility that an
early 'theory of mind' is induced by culture-specific language practices
(Brown 2002).[16]

How do the children do it? Here's where I need a culture concept, to
capture the coherence of semiotic systems across different domains. The
supports to children learning this system so apparently effortlessly include
features of the pragmatics of the spatial language system, the characteristics
of caregiver speech to small children, the spatial consistency of gesture ac-
companying speech, the early engagement of children in the adult world (to
fetch things, take messages, take responsibility for child care). I need a cul-
ture concept to talk about the 'limited holism' of symbolic systems linking
otherwise disparate activities and realms of social life into coherent patterns.
This is not just a random collection of traits; the parts make sense taken
together, and the sense that they make makes them accessible to the learner.

Some far-reaching conclusions emerge from this research, concerning
where concepts can come from. Concepts don't have to be innate: there can
be demonstrable effects of linguistic input of differing kinds on the process
of (semantic) language acquisition. As Levinson and Wilkins (in press) point
out, the abstract nature of the underlying universals means that children
have to be constructivists, not just mapping local forms onto pre-existing
innate concepts but building the concepts as they learn the language. Spatial
language is not fully pre-given, the child must construct both domain and
range, and the mappings between them. Theorists like Jackendoff, Quine,
and Gleitman have thought this logically impossible; therefore the concepts
must be innate. The Tzeltal findings suggest that there may well be other
solutions to the logical problems, solutions derived from some uniquely
human abilities, for example the ability to attribute intentionality to others
(E. Goody 1995), to understand that others have minds like one's own
(Tomasello 1999), which allows humans (unlike computers) to make use of

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16 These speculations about possible cognitive effects rest to date on linguistic evidence alone;
    cognitive tests (of topological/projective reasoning, and 'theory of mind' tests) would be
    required to confirm them.

information available in social interaction, in communicative processes, to create culturally specific categories.

3. Contrasting anthropological and cognitive science perspectives on culture

The anthropological core to 'culture' is learned, accumulated over genera-
tions, and (potentially) different across social groups. Anthropologists also
generally agree on what *kinds of content* culture has, though disagree passion-
ately (in both time and space) about which are more worthy of study. They
also agree for the most part on what culture is NOT: it is not social struc-
ture, group identity, well-bounded, ahistorical, uniformly shared, or trans-
mitted intact. But most social/cultural anthropologists do not ask the ques-
tion that is surely crucial to understanding what it is to be human, the
question cognitive scientists are asking: What is the capacity for Culture?
What prerequisites allow humans to have Culture at all? The cognitive scien-
tists' focus is on ingredients of two types (again, with much disagreement
about which is the critical ingredient). Set 1 is about *cognitive architecture* (how
the brain is wired, which gives attentional and representational biases), This
architecture provides crucially for (i) symbolic capacity, (ii) hierarchic levels
of mental organization, the ability to think about our own thoughts, to
form sets of sets, and (iii) the ability to understand others as intentional
agents with minds like our own. But some cognitive scientists also postulate
a highly specified innate basis in Set 2: the *contents* of the mind, claiming 'rep-
resentational innateness' in specific specialized modules for solving particu-
lar evolutionary problems. These include, as we have seen, modules for UG,
and for Culture in the form of modular logic specified by our genes for uni-
versal cultural and social ideas. They also include word-learning theorists'
proposals for word-learning biases, Jackendoff's universal conceptual struc-
ture ("Well-Formedness Rules"), conceptual primitives (like EXIST, spatial
concepts like UP/DOWN, social concepts like PERSON, POSSESSION),
universals of color terminology, semantic primitives, 'basic concepts'.
    But what is absurd about the Set 2 claims about prerequisites for Culture
is that it's all done by intuition, with no control over the range of data; it's
embarrassingly ethnocentric. The basic problem with these proposals is that
they have the *wrong kind of content* in them – way too much content. Con-
straints do exist, but they have to be more like syntax, less like semantics.
We have to distinguish the architecture claims (symbolic capacity, hierarchic
levels) from the content claims (the concept of 'property') – and be skeptical
of the latter. I see my Tzeltal child language work as (in part) aimed at test-
ing and challenging these content claims: I drag bits and pieces of what are
proposed as part of 'universal content of mind' over into the 'culturally
variable' and learnable arena. In sum, I propose redefining the job as a mat-

ter of assessing the *interplay* between cognitive preconditions to language and cultural learning, as well as the linguistic preconditions to advanced conceptual development.

The news to cognitive science from this research is that universals of mind are not the whole story in the domain of space. Absolute spatial systems are widespread across the world, they do not necessarily coexist with other systems of spatial reckoning, they clearly can affect everyday cognition, reasoning, and memory, they can affect children's learning of the semantics of their language, and possibly even influence the children's cognitive development. These results encourage some optimism that we may finally be moving away from universals vs. particulars as poles in an argument to an awareness that these must coexist. Even if there are extensive universal properties of human cognition (as appears to be the case in the domain of space), these may be accompanied by cognition-penetrating cultural specifics (like the frame of reference used for calculating spatial relations on the horizontal).

4. What use is 'culture' to linguists?

The space work highlights three distinct ways in which culture affects language, with implications for linguistic description. Culture₁ is the sense in which cultural practices influence lexical semantics. For example, the 'up/down' meanings that are flavored by the Tzeltal Absolute system of spatial reckoning cross-cut the vocabulary, occurring in motion verbs ('ascend'/'descend' mean either vertically or along the abstract slope-of-the-land axis), positionals (e. g., *kajal* means "on top of" or "southwards of"), spatial nouns (*ajk'ol* "uphill region", *alan* "downhill region", *jejch* "acrossways regions"). There is no primary sense of vertical 'up'/'down' in this vocabulary; all is redolant of the uphill/downhill axis laid out on the land. This vocabulary is embedded in a practice of spatial reckoning with a particular mental habit. You can't describe the semantics adequately without understanding the practice.

Two other senses of culture are important to those interested in how children learn language. Culture₂ captures the thematic unity of a symbolic system, the conceptual unity across domains of social life, demonstrated for example in my findings about early culture-specific spatial meanings for words supported by semiotically-compatible properties of the culturally modified environment (e. g. household and field layout) and properties of social interaction (e. g. absolutely-oriented pointing gestures), parts of the environmental scaffolding for language learning.

Culture₃ captures the functional fit between elements across different domains, as for example I have argued in connection with children's initial

access to the linguistic system. I have shown (Brown 1997, 1998a,b) that, by
the time Tzeltal children start to speak at around 18 months, they have iso-
lated the verb root from surrounding morphemes, without much help from
prosodic cues and without a special babytalk register. Instead, cues are pro-
vided by an idiosyncracy of Tzeltal conversational style (dialogic repetition),
where responses to assertions are routinely formulated as repeats of part of
the proposition asserted, focussing on the verb. Retrospectively, it makes
sense to structure verbal discourse like this, as an aid to children's language
learning. (There may of course be many other reasons too – redundancy,
politeness, for example).

My claim is that, against a background of universal constraints on what
human minds, and cultures, can be like, children in interaction with the
cultural environment come to have distinct cognitive styles in different com-
munities of practice. These styles – like language – are *not* (for the most part)
consciously accessible. There is a taken-for-granted-way of thinking about
spatial relations that is coherent in relation to other ideas also learned along
the way. That's what I need a notion of culture for. And that's what a traits
view of disparate cultural items cannot provide.

What does a "culture" buy you? – a system greater than the sum of the
traits. If you – the learner – grasp one part of the system, you can extrapo-
late to other parts – e.g. pointing and gesture and the organization and lay-
out of fields/houses/schools and ritual all can help children to grasp the
semantics of an Absolute system in the language. The presence of these sup-
ports, and the absence of contradictory ones (left/right system, left/right
asymmetries) means that children become sensitivized to an Absolute orien-
tation in terms of the overall lay of land quite early, so they can use it to
calculate, e. g., where a bottle is in relation to a basket, lying on a flat sur-
face. Being embedded in this culturally rich, coherent set of spatial practices
is what helps the child 'get' one system (Absolute) and not another one
(Relative).

In short, we need a name for the parallels across different aspects of a given
'cultural context' that work together to support a particular cognitive style
(such as Absolute orientation), enabling children to learn it and adults to
maintain it. Cultures are overlapping sets of systems, which to some extent
can be pulled apart; they don't all have to cohere. To the extent that, in a
particular domain, they do cohere into something larger than the sum of the
individual parts, we need a concept of culture. We do not, however, need a
global theory of culture, but rather the ingredients for understanding human
nature and human differences. These will require at least the following: a
theory of mind (or mind/body, if you prefer), a theory of how cultural
environment interacts with mind, a theory of how culture and mind emerge

ontogenetically through social interaction in a community, a theory of how the capacity for culture and for language could have coevolved.

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