

Caleb Everett

Linguistic Relativity

Applications of Cognitive Linguistics



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Caleb Everett

Linguistic Relativity

Evidence Across Languages and Cognitive Domains

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Contents

Acknowledgements — v

1 Contextualizing the issues — 1

- 1.1 Introduction — 1
- 1.2 Intuitions regarding linguistic relativity — 3
- 1.3 A brief history of the linguistic relativity hypothesis — 9
- 1.4 Motivations for criticisms of the hypothesis — 22
- 1.5 Issues with some prominent criticisms — 28
- 1.6 Types of linguistic relativity — 32
- 1.7 The structure of this book — 35

2 Acknowledging diversity — 38

- 2.1 Introduction — 38
- 2.2 Cognitive diversity across human populations — 38
- 2.3 Linguistic diversity across human populations — 45
- 2.4 Conclusion — 60

3 Refining methodology — 61

- 3.1 Methodological issues to be addressed — 61
- 3.2 Conclusion — 71

4 Space — 72

- 4.1 Introduction — 72
- 4.2 Spatial topology — 74
- 4.3 Frames of reference — 79
 - 4.3.1 Experimental evidence — 79
 - 4.3.2 Some objections and other considerations — 94
- 4.4 Dead reckoning — 101
- 4.5 Discussion and conclusion — 104

5 Time — 109

- 5.1 Introduction — 109
- 5.2 Spatial metaphors and temporal conceptualization — 110
- 5.3 Crosslinguistic studies on temporal perception — 124
- 5.4 Discussion and conclusion — 136

6 Quantities — 140

- 6.1 Introduction — 140

6.2	The case of nearly anumeric language —	146
6.3	The case of anumeric language —	150
6.4	Other kinds of effects —	165
6.5	Discussion and conclusion —	167
7	Color —	170
7.1	Introduction —	170
7.2	Color categories across languages —	171
7.3	Evidence for disparate discrimination of color categories —	185
7.3.1	Categorical perception effects —	185
7.3.2	Hemisphere-variant categorical perception effects —	191
7.4	Discussion and conclusion —	196
8	Objects and substances —	200
8.1	Introduction —	200
8.2	Initial findings among the Yucatec Maya —	200
8.3	Work with speakers of other languages —	207
8.4	Discussion and conclusion —	219
9	Gender —	222
9.1	Introduction —	222
9.2	Construal of non-human entities —	225
9.3	Construal of human referents —	238
9.4	Discussion and conclusion —	245
10	Other kinds of effects —	247
10.1	Introduction —	247
10.2	Recalling accidents —	248
10.3	Emotion —	253
10.4	Counterfactual reasoning —	255
10.5	Action construal —	258
10.6	Other explorable topics —	263
11	Conclusion —	266
11.1	What this survey has demonstrated, and what it has not —	266
11.2	The reality of linguistic relativity —	274
	References —	276
	Index —	295

1 Contextualizing the issues

1.1 Introduction

It's an old question. Does language affect how you think? The answer, in very broad terms at least, has been debated for centuries. A very closely related question has been the focus of intense scrutiny among linguists and other cognitive scientists for less time, on the order of decades: do patterns of thought vary in accordance with one's native language? Put differently, does there exist a sort of linguistic relativity, such that some aspect(s) of a person's cognition depends on, or is relative in accordance with, the language employed by that person? To many, this is a fascinating question, and some even spend significant portions of their careers trying to obtain a satisfactory answer to this and related questions. One of the reasons the question is so fascinating (to some at least) is that, apart from any actual evidence that may be brought to bear in formulating a response, people often posit very divergent answers based on their intuition. There are likely few questions in the cognitive sciences that elicit such disparate intuition-based responses. To some, the answer is clearly "yes" and such respondents may even find it puzzling that anyone might answer negatively. To others the answer is patently "no", and they may be equally perplexed by the opposing view. Given that personal experience and intuition are so clearly insufficient to arrive at a consensus vis-à-vis the answer to this question, empirical data are particularly crucial to generating an adequate response. Perhaps surprisingly, despite the deep historical roots of the question at hand, quality empirical data have only been arrived at somewhat recently. The purpose of this book is to introduce you to some of that data, acquired through the research of many linguists, anthropologists, cognitive psychologists, and others "ists" in related fields. Arguably, enough data have now surfaced in the relevant literature to arrive at some sort of satisfactory answer to this question. While the title of this book hints none too subtly at an affirmative answer, it is worth noting from the outset that careful examinations of the relevant data often suggest that more nuanced approaches to the answer (rather than a vociferous "yes" or "no"), and to the formulation of the question itself, may be warranted (see Malt and Wolff [2010:11]). Nevertheless, we will adopt the position that in some general sense the question must be answered positively, since the findings surveyed in this book are difficult if not impossible to reconcile with a negative answer.

The notion that thought patterns or cognition do vary in accordance with people's languages is referred to commonly and in this book as the "linguistic

relativity hypothesis". This hypothesis was first articulated, or at least first quasi-cohesively articulated, in the work of two well-known linguists, Benjamin Whorf and his teacher Edward Sapir. (Though they never actually referred to their ideas on the topic as a "hypothesis".) For that reason, "linguistic relativity hypothesis" is often employed interchangeably in the literature with "Sapir-Whorf hypothesis" or "Whorfian hypothesis". Such interchangeability appears to be falling out of favor, though, and probably should fall out of favor completely. After all, the linguistic relativity hypothesis in its current manifestation differs in some ways from the important ideas put forth by Sapir, Whorf, or any of their influential predecessors whose work helped inform current ideas on the topic. Given that the hypothesis is continually evolving in accordance with the ongoing acquisition of relevant findings, it is in some sense inaccurate to credit any particular scholars with the hypothesis. This is not to suggest that the work of some, in particular Whorf, was not seminal to the florescence of the current crop of ideas on the subject. It clearly was, as we discuss in some detail below. Nevertheless, in this book we are not particularly concerned with the history of the linguistic relativity hypothesis, nor with meticulously depicting the ideas of any one researcher or set of researchers who has weighed in on the issue. We are instead concerned with depicting the increasingly clear tableau of evidence that is finally allowing us to rely on experimental data, rather than intuitions and anecdotal evidence alone, in deciding whether and how one's cognitive processes are affected by his/her native language.

This introductory chapter serves several basic functions: One of these is to define the linguistic relativity hypothesis with sufficient clarity as to allow us to carefully survey the evidence for the hypothesis during the remainder of the book. This requires that some attention be paid to the history of work on linguistic relativity. What will (hopefully) result from this brief discussion of some well-known ideas in the literature is a crystallization of a more contemporary linguistic relativity hypothesis, one that is clearly related to the work of researchers such as Sapir and Whorf, but which is not married to any of their specific proposals. In attempting to define the hypothesis (or more accurately, set of hypotheses), we will consider some contemporary ideas that allow us to refine the notion of linguistic relativity by differentiating types of linguistic effects on cognition. We will also consider some common objections to the notion that linguistic differences impact thought, objections that vary considerably in merit. An ancillary aim of this chapter, taken up prior to the historically oriented discussion, will be to consider intuition-based arguments for and against linguistic relativity. This consideration should allow you to think about the issue from an experiential perspective, in case linguistic relativity is not

something to which you have previously given much thought. Finally, the more pragmatic aim of this chapter is to outline the remainder of this book and to demonstrate how the themes of each chapter will be woven into a cohesive set of claims offering support for the existence of linguistic effects on nonlinguistic cognition across human populations.

1.2 Intuitions regarding linguistic relativity

It is likely that many or most of us have had personal experiences during which it was hard to transfer a thought from one language to another. Even if you speak two or more languages fluently, it is often difficult to translate ideas accurately between them, and frequently it seems that concepts are being missed even after careful deliberations over a given translation. There are clear motivations for the phrase “lost in translation”. Even that phrase itself is difficult to translate into many languages. The 2003 film *Lost in Translation*, in which Bill Murray plays an American actor in Tokyo, befuddled at times by his surrounding culture and language, was given a number of different titles during its international release.

Have you ever tried to translate a joke from one language to another? This can be a difficult or even impossible task. So often, the foundational concepts of a humorous interaction cannot be accurately captured in a target language. If you have to explain a joke, after all, it generally ceases to be funny. This alone suggests that the humorous aspects to the meaning of any interaction cannot be completely translated, because translation so often entails the explanation of one set of lexical items in terms of a set of others. Take the following Chris Rock joke, selected from a random online joke generator: “I live in a neighborhood so bad that you can get shot while getting shot.” A simple joke, one line long, based on simple premises. But my suspicion is that, should you try to convert it into another language, particularly one not closely related to English, you will quickly confront difficulties. For instance, while the construction “getting shot while X” is commonplace to speakers of American English and can be translated into other languages, the resultant translations may not convey a number of relevant connotations associated with the phrase. Significantly, these missed connotations are not simply a case of absent cultural cues. They relate at least in part to a grammatical phenomenon, namely a morphosyntactic construction (“getting shot while X”), that is present in English and absent in other languages. To cite another example of countless options, Woody Allen once observed that “Some guy hit my fender, and I told him, ‘Be fruitful and multiply,’ but not in those words.” In this case, the humor

results from an English phrase that has no exact analog in many languages, and furthermore is not even explicitly denoted in the quote. Is it possible to “think” this joke in another language? Can we really understand the joke in another language that does not utilize the crucial phrase that is only obliquely referred to in the English original?

Of course translation difficulties are not restricted to humor. If they were, they would have little to offer in the way of evidence of non-trivial cognitive effects dictated by crosslinguistic disparities. Often, though, translation difficulties reflect systematic differences in the way certain semantic domains are encoded in different languages. In these cases, intuition (and, again, we are not claiming that intuition is sufficient to resolve these issues) seems to point to very different associated patterns of thought. Systematic differences of the sort I am referring to surface for example when one language has more words at its disposal when referring to a particular semantic category. Perhaps the most famous example here is the oft-incorrectly-cited case of words for snow in Eskimo. It has been claimed that Eskimos have dozens if not hundreds of words for snow in their language, a claim that we will see is remarkably exaggerated. Yet there are innumerable less extreme yet analogous examples. We will offer a few taken from personal experience. You may very well have your own examples.

Let me start with an example that is at least somewhat systematic and clearly relates to the cultures of two different groups of speakers who enjoy, perhaps to varying degrees, the same game: soccer. The groups are Brazilian Portuguese speakers and American English speakers. Categorizing in a very coarse manner, it is fair to suggest that the soccer-playing characteristics of Brazilians differs dramatically from that of Americans, both in terms of style and success in competitions. Stereotypically anyway, Brazilian soccer players rely on flair and individual ability, while Americans rely on teamwork, athleticism, and less on individual technical ability. Such differences between American soccer subculture and Brazilian *futebol* subculture are reflected in lexical patterns. So, for example, consider the words for two types of dribbles carried out in an attempt to maintain possession of the ball at the expense of an opponent. One of these involves the ball-holder lifting the ball over the defender’s head and retaining possession on the other side of the defender’s body. The successful completion of this maneuver is most often called a *lençol* (‘sheet’) or a *chapeu* (‘hat’) in Portuguese. (These differ from a related dribble called the *lambreta* [‘scooter’]). The metaphorical bases for these terms are transparent, since both refer to items that can be pulled over one’s head. In Brazil, if you are unfortunate to have an opponent give you a *chapeu* or *lençol* during play, you are likely to hear about it afterward. In pick-up games, discus-

sion often ensues after the completion of such a maneuver as to whether in fact the ball cleared the opponent's head. In some contexts such a maneuver may be celebrated or talked about as much as the scoring of a goal. The point here is that there is often a significant amount of energy and discussion about whether a particular maneuver did or did not constitute a *chapeu* or *lençol*. Conversely, in my experience the attention paid to this maneuver is noticeably less among most American soccer players, quite possibly since this maneuver is not lexically encoded. That is, there is no common expression for this dribble in American English (though some Americans may on occasion adopt the Spanish term *sombrero*). Judging from intuition and personal experience only, it seems possible if not plausible that the absence of any relevant well-known terms for this maneuver has real consequences in terms of the conceptualization of the maneuver itself, and the degree of focus on it, by Americans. Since most American players lack a term for the concept to facilitate discussion of and verbally allow for emphasis of the act, it would be surprising to me if they thought about the maneuver in the same manner as Brazilian players (not impossible, just surprising). In other words, while the soccer cultures in question may play a role in emphasizing the dribble in question to varying degrees, the languages of the two cultures also seem to influence the extent to which the maneuver is conceptually reified.

Even in this very restricted domain of soccer playing across only two represented cultures, other examples could be purveyed. Another common dribble employed in soccer involves kicking the ball between a non-goalie opponent's legs. Here again American English speakers are at a lexical disadvantage. I am aware of only one common term for this maneuver in American English, *nutmeg*, while I have heard at least four terms for this dribble (or, more precisely, variants of it) in Brazilian Portuguese: *caneta* ('pen'), *rolinho* ('little roll'), *ovinho* ('little egg'), and *saia* ('skirt'). Some players seem more concerned with pulling off such maneuvers than scoring goals. More to the point, some Brazilian players insist there are clear yet minor disparities between some subset of these maneuvers, all of which involve the ball traveling through an opponent's legs and are represented via the same cover term in American English. So while Brazilian speakers may not have more words for snow than their American counterparts, it seems they have more words for varieties of soccer dribbles, which in some cases reflect nuanced distinctions between maneuvers and appear to have real consequences on the way the dribbles are conceptualized. Of course such experiential examples are useful for anecdotal purposes only, and I have not conducted any experiments to test for differences in the conceptualizations of these dribbles resulting from the manner in which they are described verbally.

Such cases from day-to-day life do hint at differences in vocabulary potentially generating differences in the attention directed towards, and the construal of, nonlinguistic features of our environment. Nevertheless, they also seem a bit trivial. They do not relate to major differences between languages, only to minor lexical disparities. And it would probably be a stretch to attribute pronounced thought differences to such minor differences in word inventories. But what about more systematic semantic differences between languages? If you have ever had the opportunity to investigate or learn a language that is completely unrelated to your own, you have likely uncovered such systematic differences. Consider an example from my own fieldwork among the Karitiâna, a group of about three hundred people who speak a Tupí language in southern Amazonia. When learning their language I was surprised to discover that the Karitiâna have no exact translation for ‘monkey’. Instead there are numerous words for species of monkeys that are familiar to their ecology, including *õrõm* (‘ateles paniscus’), *pikõm* (‘cebus apella’), *irõnh* (‘saimiri sciureus’), and *ery* (‘callicebus callicebus moloch’). It is fair to say that most English speakers would be unable to provide names for these species, since monkey-species nomenclature is not a part of their vocabularies. In fact, when presented with pictures of the relevant species, English speakers typically refer to them via the cover term “monkey” that has no analog in Karitiâna. So what are we to make of this? Is this just a trivial linguistic difference? The Karitiâna have potential cultural motivations for lexically accentuating differences among these species, and not grouping them in the way English speakers do. For instance, some of these monkeys (particularly *pikõm*) are considered great ingredients for stew, and are coveted food items. Others are not. Crucially, all the experiential evidence (a type which has clear limitations, discussed in Section 1.4) I have is consistent with the notion that these terminological distinctions and the absence of a basic superordinate cover term for ‘monkey’ assist in the Karitiânas’ discriminations of these monkey types. At the least, it is indisputable that there is no native concept for ‘monkey’ coded in the Karitiâna language, whereas myriad related concepts are coded in the language in a way that they are not for most English speakers.¹ Now of course Karitiâna speakers can learn a superordinate term and most are familiar with the Portuguese term *macaco*, just as an English zoologist may learn an even greater range of names of monkey species. But the point remains that such non-equiv-

¹ As research such as Berlin (1992) and Atran (1993) has demonstrated, in smaller non-industrialized societies the most basic ethnobiological terms, characterized by developmental primacy, tend to refer to more specific species-categorizations than basic terms in English. In other words, the pattern evident in Karitiâna monkey terminology is not aberrant.

alencies across this semantic category hint at very real distinctions in the manner in which the animals in question are construed by speakers of the two different languages. For any pair of languages, an assortment of such systematic or near-systematic disparities in the structures of lexical categories may be adduced. Often these disparities owe themselves to clear ecological factors (e.g. differences in the flora and fauna encountered in the daily lives of Americans and Karitiânas), or some more abstract cultural factor (e.g. soccer concepts shared by many Brazilians). To many, including myself, it seems plausible that such lexical disparities reflect and reinforce differences in the way speakers conceptualize the relevant entities, even in nonlinguistic contexts. The intuition of others may not accord with this relativistic interpretation, though, and they may remain unconvinced by such anecdotal data. They may even find it implausible that the Karitiâna taxonomy of monkey species reifies/enforces greater conceptual distinctions between monkey types, even during nonlinguistic thought. They may suggest instead that, just because most English speakers lack the hyponyms for certain monkey species, this does not imply that the speakers do not recognize or conceptualize the differences between those species, at least once they have some experience with the monkeys in question. Conversely, some might suggest that just because the Karitiâna have no superordinate term for ‘monkey’, this does not imply that they do not, or do not typically, recognize a class of species that English speakers label with the term ‘monkey’. I could offer more experientially based opinions and anecdotes based on time spent with the people, but these would not convince skeptics since opinions and anecdotes in and of themselves do not constitute objective data. After all, such intuition-based opinions may be subject to all sorts of biases on my own part, of which I may or may not be cognizant. As centuries of discussion on the relationship between language and cognition have demonstrated pretty clearly, anecdotes and experiential evidence alone will not resolve such debates.

The absence of complete correspondence of concepts across languages was first observed long ago. For instance, the 13th century English philosopher and friar Roger Bacon suggested that variances in semantic concepts across languages made loss-less translation impossible (Kelly [1979:9]). In this way his opinion diverged from another philosopher and clergyman who predated him by nine centuries, St. Augustine. For millennia believers of various faiths have struggled with the translation of their scriptures. It is a very onerous task, often taking decades, and many doubt that the resultant translations are in fact loss-less. One of the many difficulties faced in such translation is the transfer of idiomatic expressions. Consider, for instance, translating a concept such as “lamb of God” into an Amazonian language. Just that phrase alone, which is

found in English translations of John's writings in the Christian New Testament, presents a series of obstacles. An obvious one is that Amazonian cultures do not have sheep or lambs, and have often not typically been exposed to these species. Another is that shepherding is a foreign activity. These difficulties may seem more cultural than linguistic (assuming for now a simple division between culture and language), but other difficulties are not. The phrase itself relies on a metaphorical correspondence between animal sacrifice and other sorts of sacrifice, i.e. those required for spiritual salvation according to some believers of the scriptures in question. In other words, "lamb of God" indexes metaphors shared by speakers of English, while also indexing some major concepts (lambs and a monotheistic entity) that are foreign to many cultures. This phrase has been translated thousands of times into unrelated languages, but it would seem that in many cases there is some inevitable loss of meaning, however minor, across the translations. It serves as a useful illustration since it reflects the centuries with which people have been seriously struggling with representing the concepts denoted in one language in a language that does not share some crucial component concepts.

The difficulty of transferring concepts from one language to another is consonant with the notion of linguistic relativity. Such difficulty implies that, in some cases anyway, there are obstacles to thinking the same exact thoughts while utilizing different languages. In the light of such difficulty, it is not a stretch to think that different languages affect how their speakers think in general terms. But note that the latter claim is different than the former, and while the two are related the former cannot be offered as unequivocal support for the latter. The idea we are interested in here is whether different languages have demonstrable effects on the *nonlinguistic* cognition of their speakers. Difficulties in translation may provide intuitive support for this notion, but they do not directly impinge on the issue of nonlinguistic thought. Just because people speak in very different ways does not necessarily mean these speech differences yield disparities in how they think when they are not speaking. Furthermore, if real differences in thought are hinted at by differences in languages, this does not imply that the linguistic differences are themselves the shapers of those thought differences. After all, differences in conceptual and linguistic patterns may be due to some other underlying factor, perhaps broad cultural distinctions that yield affects on both language and thought. Regardless of the conceptual differences hinted at by challenges in translation, such challenges cannot establish a causal influence of linguistic disparities on thought, much as intuitions alone cannot. The inadequacy of such kinds of evidence has nevertheless frequently been ignored in the past, to the detriment of serious inquiries into linguistic relativity.

1.3 A brief history of the linguistic relativity hypothesis

The genesis and dissemination of the linguistic relativity hypothesis has a long and, in many instances, contentious history. The hypothesis is closely affiliated with other tenets in philosophy and the social sciences, and is sometimes mistaken for them. For instance, there is a long line of influential writers who at some point appeared to equate thought with language, to varying degrees. This list includes Plato (1892:252), Kant (1988[1798]:278), Watson (1913), Wittgenstein (1922), and Humboldt (1988[1836]). For instance, Humboldt noted that “Language is the formative organ of thought... Thought and language are therefore one and inseparable from each other.” (1988:54) Now if language and thought are indistinguishable, it follows naturally that which language you speak will have a profound effect on your cognition more generally, assuming that differences across languages exist. In fact, the consequence of such an interpretation of the language-thought relationship is a sort of strong linguistic determinism, according to which your way of thinking is completely constrained and determined by the language(s) you speak natively. In the well-known words of Wittgenstein, “The limits of my language mean the limits of my world.” (1922, proposition 5.6)

There are difficulties with the tack of equating language and thought. It seems clear, for example, that other species are quite capable of thinking, and often in sophisticated ways. Research on primates, for instance, is continually revealing new cognitive capacities of species ranging from capuchin monkeys to bonobos (see e.g. Tomasello and Call 1997). Research on dogs, dolphins and non-mammals, particularly a number of avian species, reveals frequently comparable results. Given that it is widely accepted that such species do not share language with humans, but clearly share a variety of cognitive abilities with us, it seems clear that language is not required for thought, and consequently should not be equated with it. Furthermore, studies with pre-linguistic infants suggests that they possess a variety of cognitive skills that one might assume requires language, but in fact precedes linguistic behavior ontogenetically. For example, infants are capable of some very basic arithmetic (Wynn [1992]).

Contra the simplified assumptions of some scholars (e.g. Pinker [1994]—see Section 1.5), however, contemporary work on linguistic relativity does not presume that language and thought are completely dissociable. Researchers who do this work are concerned with whether crosslinguistic dissimilarities yield dissimilarities in thought, and with establishing not only the existence but the magnitude of such potential dissimilarities. This very distinguishable issue has also received a fair amount of attention in the literature over the

years, and it is worth tracing the trajectory of the idea, so that we can contextualize the contemporary work discussed in this text. I should stress that what follows is an extremely abbreviated discussion of the history of work on linguistic relativity. For more detailed treatments on this subject I refer the reader to works such as Aarsleff (1982) Koerner (1992), Lucy (e.g. 1992a, 1997, 2004), and Leavitt (2011).

There is a reason that the terms “linguistic relativity” and “Sapir-Whorf hypothesis” are often employed interchangeably, and further that the second term is often shortened to the “Whorf hypothesis”. The reason is simple: more than any other researcher, Benjamin Whorf was responsible for formulating a coherent treatise on the effects of linguistic differences on thought. Whorf’s work on the topic was clearly heavily influenced by his mentor, Edward Sapir, whose own work was colored by Franz Boas and other American ethnolinguists such as William Whitney. Whitney was, in turn, influenced by the renowned German linguist Wilhelm von Humboldt. The latter researcher’s views were themselves affected by correspondence with linguists in America such as John Pickering and Peter Du Ponceau, not to mention some of the ideals that surfaced during the French enlightenment (see Aarsleff [1988]). In short, the lineage of influence on Whorf can be traced back to increasingly remote time-depths, and to some extent the cut-off point to such a tracing is arbitrary. Some, though by no means all, of the central components of a linguistic relativity hypothesis are evident in the work of scholars such as Johann Hamman, Johann Herder, and even Ferdinand Saussure. In fact, the prevalent structuralism of the early twentieth century, which owed itself so much to the work of Saussure, was very compatible with the more explicitly relativistic views of Sapir and particularly Whorf (see Gumperz and Levinson [1996], Koerner [1992]). Structuralism suggests, after all, that components of semantic systems such as a particular morpheme are imbued with meaning only in the context of the oppositions they present to other components. In other words, the meaning of a particular morpheme or word can only be comprehended contextually, within a greater semantic matrix. Given the readily apparent divergences between semantic systems across languages, it arguably follows from structuralism that the meaning of a given word or morpheme, and the associated conceptualization of a given denoted entity, depends in large measure on the language being utilized. At the least, it seems clear that structuralism was not inconsistent with the notion of linguistic relativity.

Given the prevalence of ideas that were consistent with a linguistic relativity hypothesis of some kind during the latter part of the 19th century, the first part of the 20th century, and even earlier, it is difficult to definitively establish authorship of the hypothesis. Koerner (1992:174) makes the following pertinent

observation: “As Christmann (1967) has shown, essential ingredients of the idea can be found in the writings of a number of 17th- and 18th- century thinkers, among them Vico and Herder, with the result that Justice (1987:56) spoke of a ‘Vico-Herder-Humboldt-Sapir-Whorf hypothesis’.”

Still, while the geneses of many hypotheses are difficult to pinpoint, there is often a clear stage at which an idea or set of ideas is more wholly developed and lucidly delineated, at which it has truly “arrived”. In the case of linguistic relativity, it seems clear that this arrival only occurred with the work of Benjamin Whorf. Which is not to suggest that Sapir’s work is not extremely important in this context. In fact, among other contributions, Sapir was the first author to co-opt the term “relativity” for linguistic purposes:

It would be impossible to go on indefinitely with such examples of incommensurable analyses of experience in different languages. The upshot of it all would be to make very real to us a kind of relativity that is generally hidden from us by our naïve acceptance of fixed habits of speech as guides to an objective understanding of the nature of experience. This is the relativity of concepts or, as it might be called, the relativity of the form of thought. (1949 [1924]: 159)

It is important to stress, though, that Sapir still viewed humans as sharing an essential psychological common ground, or psychic unity, a perspective he shared with his mentor Franz Boas, the founder of American anthropology who stressed the psychic unity of mankind (see Lucy [1992a] for discussion). As noted in Sapir and Swadesh (1964[1946]:101): “All forms of linguistic expression are reducible to a common psychological ground, but this ground cannot be properly understood without the perspective gained from a sympathetic study of the forms themselves.”

Another important view shared by Sapir and Boas was the notion that the influence of culture on language held more strongly than the converse influence. In other words, the relativity Sapir spoke of might best be termed “cultural relativity” rather than “linguistic relativity”. Nevertheless he did suggest that one’s language could directly constrain her/his thoughts, for example when he noted that “the ‘real world’ is to a large extent unconsciously built up on the language habits of the group.” (Sapir [1949 (1929)]:162) However, in the same work Sapir spoke of language as operating as a “guide” to culture, and elsewhere his writings suggest that language serves to create a common understanding that constitutes culture. In short, while Sapir spoke of relativity of thought, his relevant work was predominantly oriented towards cultural disparity being the primary effector of relativity, with language serving as crucial symbolic guide to cultures. Furthermore, unlike Whorf, Sapir’s discussions of the influences of language on thought, like the work of his predecessors, are somewhat devoid of specifics. He does not discuss in detail any cases or

illustrations of the relativity he envisions, and his perspective on the relevant issues is more nebulous than that of his student. After all, Sapir was not attempting to draft some sort of testable linguistic relativity hypothesis. In touching on this issue, he was in large measure attempting (like Boas) to argue against a simplistic view of linguistic-cultural co-evolution that was so prevalent during his day, and which had been made prevalent in the work of previous influential researchers such as Humboldt. This perspective held, among other oversimplifications, that inflectional morphologies exhibited a positive correlation with more “advanced” cultural features, and was used by some to buttress the legitimization of the notion that some languages and cultures represented earlier evolutionary stages. This misappropriation of the tenets of evolution was objected to by Boas (1966[1911]) and Sapir, who stressed the need to actually examine the complex structural systems evident in indigenous languages, particularly those in the Americas they devoted much of their lives to documenting. In short, Boas and Sapir were both believers in the theoretical existence of a basic “psychic unity of mankind,” who nevertheless apparently felt that fleshing out our understanding of this unity required clear documentations of the numerous complex languages in existence. The clear delineation of any relativity hypothesis seems to have been, at best, tangential to Sapir’s aims. Some of his work is consonant with the subsequent formulations of the notion, though—most notably when he suggests that certain categories reflected in particular languages “are not so much discovered in experience as imposed upon it because of the tyrannical hold that linguistic form has upon our orientation in the world.” (1964[1931]:138)

Only in Whorf’s work is linguistic relativity formulated as a cohesive, or nearly cohesive, set of ideas regarding the influence of different languages on the thoughts of their speakers. Whorf addressed this issue with a greater deal of specificity than had been observed in the literature, and was the first author to develop concrete and specific examples of how features of particular languages putatively generated more widespread effects on the cognitive processes of their speakers (see Lucy [1992a, 1996]). Many of these examples have been the subject of criticism in the intervening years. Nevertheless, Whorf’s ideas on the subject captured the fancy of many, and had a profound effect on the work of other researchers, including many contemporary ones whose work is the real subject of this book. So we will restrict the remainder of our discussion of the origins of linguistic relativity as a coherent concept to Whorf’s work, bearing in mind the close relationship of that work to that of his immediate predecessors, most notably Sapir.

Whorf was a chemical engineer who, despite years of expressed interest in linguistics, only began formal studies on the subject (at Yale, with Sapir) at

the age of 31, and who only lived another ten years beyond that point. Yet, contrary to the inaccurate characterizations sometimes offered, Whorf was not simply an “amateur” linguist. In fact, he was a remarkably productive scholar who published in major linguistic journals while contributing in important ways to a variety of linguistic sub-fields. A very influential collection of his work was published posthumously (Whorf [1956]). It is worth mentioning that much of this work was not related to the topic of linguistic relativity, and included extensive studies of Hopi and Nahuatl grammar, as well as work on Maya hieroglyphs. For an extremely comprehensive treatment of Whorf’s work, as well as some important biographical background, see Lee (1996).

Among the most frequently cited selections from Whorf’s work on the subject is the following, which represents the first clear formulation employing the term “linguistic relativity”: “From this pact proceeds what I have called the ‘linguistic relativity principle,’² which means, in informal terms, that users of markedly different grammars are pointed by the grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world.” (1956:221)

Lest one assume that the diversity of observations highlighted by different grammars was of a trivial sort, consider the following (also-well-known) excerpt: “Are our own concepts of ‘time,’ ‘space,’ and ‘matter’ given in substantially the same form by experience to all men, or are they in part conditioned by the structure of particular languages? Are there traceable affinities between (a) cultural and behavioral norms and (b) large-scale linguistic patterns?” (1956:138) Aside from the clear Einsteinian homage in the discussion of these ideas vis-à-vis a relativity of “time”, “space”, and “matter”, what strikes one about this excerpt is the gravity of the relativity propounded by Whorf. He suggests that the perception of some very fundamental concepts may be influenced by language. Such a suggestion may seem extreme, and was uncorroborated in Whorf’s work. However, that work hinted at ways in which corroboration might be achieved, and it is interesting to note that recent work has now provided data that are consistent with Whorf’s ideas that even the conceptualization of space (see Chapter 4 of this text), time (Chapter 5), and matter (Chapter 8) are in fact affected by linguistic patterns. This is not to suggest that the

2 Note that Whorf did not refer to the linguistic relativity “hypothesis”, as noted in Lee (1996) and Scholz, Pelletier, and Pullum (2011). Instead he discussed the “principle” of linguistic relativity. According to the analysis in Lee (1996), this principle was one of several crucial principles in Whorf’s larger “theory complex” on the nature of linguistic thought. For a synopsis of the twelve major points in that complex, see Lee (1996:30–33).

relevant research has served simply to vindicate Whorf's claims, since his claims regarding the domains in question were not particularly concrete or specific.

Perhaps the most famous comments by Whorf on the matter are the following:

The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized in our minds – and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way – an agreement that holds throughout our speech community and is codified in the patterns of our language. (1956:213)

These comments, it should be noted, have often been misinterpreted or over-interpreted in the intervening years. They have often been taken as being suggestive of a particularly strong sort of linguistic determinism, according to which speakers are incapable of loosing the linguistic handcuffs placed upon them during infancy. Such interpretations are generally inconsistent with the bulk of Whorf's work, however (see Lucy [1992a]), though when read in isolation these comments do not seem far afield from a strongly deterministic perspective. Regardless, we are interested in Whorf's perspective as it relates to the notion of linguistic relativity, i.e. the idea that systematic differences across languages lead to differences in nonlinguistic cognition, differences that are not necessarily impossible to overcome. We are not concerned with the notion of linguistic determinism, which is simply the idea that one's thoughts are completely governed by her/his native language.

By now it is hopefully clear what Whorf meant by linguistic relativity, at least in general terms. In the years since Whorf's work, the popularity of linguistic relativity has waxed and waned in large measure in accordance with the popularity of over-arching paradigms in the social sciences. So Whorf's work was met with initial enthusiasm at a time when behaviorism was prominent, and not surprisingly this enthusiasm dwindled with the rise of nativism, most notably the nativist Chomskyan paradigm in linguistics. (Though the Chomskyan framework is not necessarily incompatible with the Whorf's principle of relativity—see discussion in Scholz, Pelletier, and Pullum [2011].) The hypothesis was particularly prone to shifts in paradigmatic winds since little convincing evidence was presented on its behalf, either by Whorf or by any other proponents of the idea, prior to the last decade or so of the twentieth century. Which is not to suggest that Whorf presented *no* evidence in support of linguistic relativity. Next we briefly consider the most widely circulated exemplifications of relativity offered by Whorf, with the caveat that these

examples are not being endorsed here as evidence for the hypothesis. They represent instead cases that may be taken to support the relativistic position on a less rigorous, more intuitive, plane. The examples fall into two broad types of relativistic effects according to which the divergent structures of semantic systems in contrasted languages supposedly influence their speakers' thoughts.

One type of evidence presented by Whorf related to the way in which languages "dissect nature differently" (1956:208). This sort of evidence was offered prominently in his papers entitled "Science and linguistics" (1940), "Language and logic" (1941), and "Language, mind and reality" (1941), all included in Carroll's compendium (Whorf [1956]). In "Science and Linguistics", he offers several cases not too dissimilar from the examples I offered above based on my own personal experience (and not much more rigorously either). In such cases, one language offers several lexical items or categories, including verbal and nominal ones, for a set of distinctions that are apparently not coded in another language. For example, Whorf notes that the Hopi have one noun for flying things besides birds, and that this noun can refer to insects, aviators, or airplanes. The assumption here seems to be that Hopi speakers conceive of flying entities in a dissimilar (more unified?) way than English speakers, perhaps like English speakers seem to conceive of certain soccer maneuvers in a different (more unified?) manner when contrasted with Brazilian Portuguese speakers. Note that no actual evidence was provided for either claim.

Another parallel example was employed by Whorf, and this example (perhaps unfortunately) came to be the poster child for linguistic relativity. Specifically, Whorf (in)famously contrasted the number of words for snow in English and Eskimo, a subject that had received some attention in Boas' work (1966[1911]:21–22). Whorf stated that:

We have the same word for falling snow, snow on the ground, snow packed hard like ice, slushy snow, wind-driven flying snow – whatever the situation may be. To an Eskimo, this all-inclusive word would be almost unthinkable; he would say that falling snow, slushy snow, and so on, are sensuously and operationally different, different things to contend with; he uses different words for them and for other kinds of snow. The Aztecs go even farther than we in the opposite direction, with 'cold,' 'ice,' and 'snow' all represented by the same basic word with different terminations; 'iced' is the noun form; 'cold' the adjectival form; and for 'snow,' "ice mist." (1956:216)

There are several well-known issues with this claim, not the least of which is that Whorf makes claims about Eskimo nonlinguistic cognition based entirely on linguistic evidence. One gets the idea of the sort of cognitive disparity being hinted at, though, of the same ilk as that hinted at by the lexical disparities

between Karitiâna and English vis-à-vis basic terms for “monkey” and its hyponyms.

We might call this sort of relativistic influence a “categorization” effect, according to which the way in which a particular semantic field is divided up in a given language impacts the ontological ratiocination of its speakers. Judging from Whorf’s examples, one of the corollaries of this proposed effect is that speakers with a greater number of basic lexical items for a given semantic field construe that semantic field in more precise or discriminating ways than speakers lacking such terms. In the cited section above, for example, the explicit claim is made that Eskimos perceive falling snow and slushy snow to be “sensuously and operationally different.” The only evidence presented in support of this claim is the fact that such concepts can be teased apart lexically with greater ease in Eskimo. The claim for divergent sensory and operational experiences of snow across the two groups in question is not further substantiated. Nevertheless, we get the sense of what Whorf is claiming regarding these “categorization” type effects, viz. that greater perceptual refinement is implied by more detailed lexical demarcations between portions of a given semantic domain.

Another well-known example of such a categorization type of relativistic effect is Whorf’s claim that the means for coding temporal concepts are limited in Hopi, when contrasted with English. Here the categorization effect in question is grammatical, rather than lexical, but it nevertheless denotes a particular semantic domain that is split in different ways across the languages in question. According to Whorf, “Hopi may be called a timeless language” (1956:216), in large measure because “the Hopi verb gets along without tenses” (217). Setting aside Whorf’s oversimplification of the ways in which Hopi speakers denote temporal deixis, the implication is that the types of categories evident in the English tense system affect its speakers’ conceptions of time in a way that is unfamiliar to Hopi speakers. Among other distinctions, the three-fold “past”, “present”, and “future” distinction in English and other European languages helps to yield, according to Whorf, a greater objectification of time that enables speakers to imagine time as the occurrence of sequential “units” in ways not possible (or at least quite difficult) for Hopi speakers. (See Whorf [1956]:143–145, 216–218 for a more detailed account).

Another example of the sort of “categorization” effects offered by Whorf is the count-mass nominal distinction evident in some languages. As Whorf notes, in “Standard Average European” the distinction between count and mass nouns is evident in pluralization strategies, e.g. “mass nouns lack plurals, in English drop particles, and in French take the article *du, de la, des.*” (1956:140) Significantly, Whorf suggests, the division of matter into two broad

categories of countable and non-countable entities does not actually reflect natural categories. Aside from a handful of cases such as air, sand, and water, “few natural occurrences present themselves as unbounded events” (1956:141). The net result of Standard Average European’s rigid division between count and mass nouns is, according to Whorf, that this distinction is forced upon speakers’ perceptions of types of matter. Conversely, Hopi speakers are free to perceive matter types without this particular enforcement of categories since their language “contains no formal subclass of mass nouns.” (1956:141)

The preceding examples illustrate the sorts of categorization-type effects suggested by Whorf in his examinations of the ways in which disparate languages split various semantic fields, supposedly yielding correlated splits in conceptual patterns. There are issues with these particular categorization-type effects, as scholars have noted subsequent to Whorf’s work. Nevertheless these sorts of examples did strike a chord with many readers, and continue to do so. And while Whorf’s examples are largely unsubstantiated by the desirable nonlinguistic corroboration, research related to those examples is now being undertaken, for instance on the nonlinguistic classification of kinds of matter (see chapter 8).

The other principal sort of relativistic effect suggested by Whorf and discussed in detail in “The Relation of Habitual Thought and Behavior to Language”, first published in 1941 and also included in Carroll’s collection, might be termed an “analogy-based” effect. This type of relativistic effect can be further sub-categorized into lexical and grammatical analogies (see Lucy [1992a] for a detailed discussion). Whorf’s most well known illustration of this sort of effect is a lexical analogy that putatively results in a perceptual effect for English speakers who use the word “empty”.

During his employ with the Hartford Fire Insurance Company, Whorf analyzed hundreds of reports regarding the manner in which particular fires started. He believed these reports suggested that individuals were more careful around storage units labeled “gasoline drums” than those labeled “empty gasoline drums.” (1956:135) Assuming Whorf’s claim is correct (he provides no systematic analysis of the reports), this is a noteworthy correlation since it is plausibly explained by linguistic factors. In his words:

Thus, around a storage of what are called “gasoline drums,” behavior will tend to a certain type, that is, great care will be exercised; while around a storage of what are called “empty gasoline drums,” it will tend to be different – careless, with little repression of smoking or of tossing cigarette stubs about. Yet the “empty” drums are perhaps the more dangerous, since they contain explosive vapor. Physically the situation is hazardous, but the linguistic analysis according to regular analogy must employ the word ‘empty,’ which inevitably suggests lack of hazard. (1956:135)

Now the word “empty” can be used in a strict manner that is synonymous with “null and void, negative, inert” (1956:135). It can also be used in a more colloquial manner, though, according to which something is empty but no claims regarding vapor are implied. If I say a barrel (or gas tank or suitcase or room...) is empty, for instance, there is typically no implication that the all gases such as oxygen have been vacuumed out. This duplicity of meaning leads to analogy-based behavior that would presumably not be observed in the behavior of speakers of other languages without the distinction. If a gasoline drum is labeled in a colloquial manner in which no implication of vapor absence is assumed, but encountered in another environment in which the label is interpreted strictly, the results are dangerous according to Whorf. The contents of the barrel are often perceived, by way of an analogy (or simply a misinterpretation) based on a slightly different definition of the word, as lacking all contents including hazardous ones. As a result, suggests Whorf, workers around “empty” gas drums behave carelessly at times, as though no vapors were contained in the drums. There is a prediction here: Workers who do not speak English or any other language that facilitates the sort of analogical reasoning characterized above might exhibit safer behavior in such contexts. The clear implication of such an example, and of other similar ones (see Whorf [1956:135], as well as Carroll [1956:29–30] for discussion), is that nonlinguistic behavior in such cases is conditioned in large part by one’s native language.

Whorf presented numerous examples of analogy-type effects and categorization-type effects in his work. Those described above are illustrative of the sorts of relativistic effects he claimed to exist. In short, he believed that any language is systematically structured in its semantics, and that this structure has demonstrable effects on speakers’ nonlinguistic categorization and perception. (Whorf 1956:252) This structuring is enforced by overt and covert linguistic categories, sometimes termed “phenotypes” and “cryptotypes”, respectively. Even in the few examples of Whorf’s discussed above, it is clear that such systematically structured categories could be lexical or grammatical in nature. Crosslinguistic dissimilarities in lexical or grammatical categories, according to his account, result in correlated behavioral and cognitive dissimilarity. It should be stressed that Whorf never suggested that these effects completely determine speakers’ thoughts in a manner that results in cognitive incommensurability across populations (Kay and Kempton [1984:76–77]).

Whorf’s work was crucial to the establishment of linguistic relativity as a viable concept, and there is much in contemporary research on the topic that owes itself to his relevant ideas. Yet it would also be inaccurate to see the current body of research as connected to that of Whorf in an unbroken fashion, or to see that work as being based primarily on Whorf’s ideas. In fact, the

current research differs dramatically from Whorf's, in large measure according to methodological parameters that will crystallize during the course of this book but might be pithily encapsulated as follows: the current crop of studies on this topic is based predominantly on experimental work involving nonlinguistic tasks and carried out with speakers of two or more languages. In contrast, Whorf did not conduct any experimental tests on human cognition or behavior. His work was foundational in offering up directions to be followed in future research, and presenting tentative examples that hinted at language-influenced habitual thought. These tentative examples went unsubstantiated in his work though. This is not meant as a criticism of Whorf (after all, he died shortly after drafting some of his original hypotheses), merely as a note on the history of this research.

Gumperz and Levinson (1996:24) summarize the linguistic relativity hypothesis, in its most schematic form, with the following syllogism:³

Given that:

- (1) differences exist in linguistic categories across languages;
- (2) linguistic categories determine aspects of individuals' thinking;

then:

- (3) aspects of individuals' thinking differ across linguistic communities according to the language they speak.

Now if both (1) and (2) hold, then of course (*modus ponens*), (3) must also hold. This syllogistic reasoning is evident in Whorf's work, though not explicitly. Evidence for (3) is only now accruing, however, and the extent to which (1) and (2) hold remains a matter of some debate among linguists and others. Yet it is worth stressing that it is difficult to object to (1) and (2) in an absolute manner. Even the most ardent believer in a universal grammar must admit that *some* differences exist in linguistic categories across languages (even if they do not believe that these differences are particularly meaningful), and certainly it is difficult to avoid the conclusion, with even a modest amount of introspection, that linguistic categories determine *aspects* of thinking (even if one believes these to be superficial aspects of thinking that are only required for online linguistic processing). To a large extent, then, the question at hand is not whether (1) or (2) hold, but to what degree they hold. How significant are crosslinguistic differences? How impactful are such categories upon thought, and do they influence forms of thought beyond those directly related to constructing and deconstructing utterances?

³ This can be contrasted with the more specific formulation of the Whorfian hypothesis syllogism (Gumperz and Levinson [1996:25]).

Assuming (1) and (2) hold to some degree, however minor, our attention should naturally gravitate towards (3). How does individuals' thinking differ across linguistic communities? Is there evidence for very weak or trivial differences only? Or is there evidence for significant disparities in nonlinguistic cognition that can clearly be tied to the linguistic practices of individual communities? Or does the evidence fall somewhere in between these points? Surprisingly, in the several decades following Whorf's work there was remarkably little research undertaken to empirically address these questions, despite the fact that the acceptance of the relativistic hypothesis naturally hinges upon their answers. The absence of relevant research is particularly surprising given how popular Whorfianism became in some academic and non-academic circles, and also given how virulently it was opposed in other circles. As Levinson (2003) notes, it became a subject that many people were happy to weigh in on while vigorously attacking ideological opponents, while concomitantly adding little in the way of substantive data that could actually elucidate some of the relevant issues.

In many ways, empirical research on linguistic relativity was not taken up in earnest until the early-to-mid 1990's, most prominently in the work of John Lucy (1992b) and Stephen Levinson (1996). In this book, I take such influential works as the trigger for the explosion of serious inquiries into linguistic relativity. This is not to suggest that related research (e.g. Kay and Kempton [1984], Bloom [1981]) had not been carried out prior to that time. In fact, a number of relevant studies did surface in the linguistics and anthropology literature in the intervening decades, i.e. following Whorf's work and prior to the work of Lucy, Levinson, and a number of their colleagues mentioned in this book. With few exceptions, though, these works did not advance work on linguistic relativity empirically, and they most frequently did not generate much interest outside their specific sub-field. They often relied on linguistic data alone, and lacked data demonstrating cross-population differences in cognition, that is, they did not address point (3) in the above syllogism. Among these works, which were quite laudable in other respects, were Lee (1944) and Mathiot (1962). I refer the reader to Lucy (1992a) for a discussion of these studies as they relate to the relativity hypothesis. It is worth noting also that, during the latter part of the 20th century, cross-cultural psychology developed into a serious area of inquiry, with its flagship journal being founded in 1970. Unfortunately perhaps, most linguists remained unaware of related developments in this field and there was little cross-pollination of ideas between the fields. As a result, few studies in cross-cultural psychology impinged directly on the issue of linguistic relativity. Thankfully, that characterization is no longer accurate though it could be argued that linguistically motivated differences in psychology across cultures still receive insufficient attention.

The motivations for the decades-long delay in the start-up of the relevant research are multifarious. One significant development that contributed to the delay was the arrival of the generativist paradigm during this period. The acceptance of this paradigm seems to have played a role in leading many researchers to ignore the topic of linguistic relativity on theoretical grounds. Chomsky's (1965) influential work led many linguists to focus their attention on developing the most parsimonious theoretical treatments possible for "surface-level" crosslinguistic variation, reducing such differences to a limited set of features of a universal grammar. In some sense linguistic homogeneity became a greater focus than linguistic diversity. Practically, the universalist and innatist perspective allowed linguists to rely extensively on native-speaker elicitations, and arguably obfuscated the need for the methodological tools associated with other branches of the cognitive sciences, for instance the generation of experimental results and statistical tests on those results. (These sorts of tools are central to the works on relativity discussed in this book.) Furthermore, the belief held by many researchers that grammars are fundamentally alike seems to have devalued the need for detailed grammars of unrelated languages described on their own terms, i.e. without the encumbrances of a theoretical perspective that presumed some sort of deep-level uniformity across languages. Regardless, data on significant crosslinguistic variation (see Chapter 2), which were less and less amenable to a strong universalist account, continued to surface during the second half of the 20th century—particularly data gathered in areas such as Amazonia, New Guinea, the Caucasus, and Australia. These data contributed to numerous substantive shifts and splits in the universalist linguistic paradigm (e.g. Chomsky [1980], [1995], Pinker and Jackendoff [2005]), to the complete disenchantment of previous proponents of such an approach (e.g. Lakoff [1987], D. Everett [2005]), and to the waning influence of the universalist perspective evident today. Which is not to suggest that this perspective does not still maintain strong influence in some circles, as it clearly does.

Despite the theoretical obstacle of linguistic universalism, which gained strength shortly after the publication of Carroll's collection of Whorf's works, essential theoretical developments that were complimentary to the linguistic relativity hypothesis were also disseminated during this time, both in linguistics and in related fields. For instance, Vygotsky's (1962[1934]) influential work demonstrated the centrality of language in conceptual development. Similarly, work on semantics by authors such as Bowerman (1978) helped lead many researchers to re-focus on the semantic disparities across languages. Furthermore, linguistic anthropologists such as Silverstein (1979) and Hymes (1966) developed influential theoretical frameworks for the study of language, cul-

ture, and thought that invited rather than discouraged work on the issue, while addressing linguistic relativity at the theoretical level and demonstrating ways in which crosslinguistic variation impacts the indexical nature of communication. Within what might be termed by some “linguistics” proper, a number of very influential scholars remained devoted to exploring grammatical description and typology from a functionally and cognitively oriented perspective that did not assume universalism. These scholars include Givón (1984), Bybee (1985), Langacker (1991) and Comrie (1981).

All of these non-universalist strands of research ultimately contributed in one way or another to current inquiries into linguistic relativity, which were more directly triggered by the work of Lucy, Levinson, and their colleagues. This inquiry has been referred to occasionally as a “resurgence” of Whorfianism, or as “neo-Whorfianism”. In many ways it is not a resurgence, however, but a re-envisioning of what work on this topic should consist of. The research described in this book is not modeled specifically after Whorf’s, after all. It relates to some of the issues he drew attention to, but it is very non-Whorfian methodologically. Approaches to the subject are constantly evolving and being impacted by the work of numerous parties in related fields of the cognitive sciences. In this book we will avoid the association of research on linguistic relativity with labels bearing the names of particular researchers such as Whorf. Such terms increase the odds that the research will be judged not on its own merits, but on the merits of work from another era that differed in many significant respects. I will refer instead simply to work on “linguistic relativity”, the hypothesis that crosslinguistic differences have *any* demonstrable effects on nonlinguistic cognition (Lucy 1997:295). More specific formulations of this general hypothesis are taken to be mutable, changing in accordance with our increasing understanding of the strength and pervasiveness, or lack thereof, of relativistic effects.

1.4 Motivations for criticisms of the hypothesis

There are many reasons that the linguistic relativity hypothesis failed to gain traction during the latter half of the 20th century, some of which were touched on in the preceding section. In many cases the relevant studies produced were susceptible to valid methodological criticisms, which our discussion has so far hinted at but not fully explored. Some of these criticisms have been crucial in shaping the research surveyed in this book. Other points have been less influential since, we will argue, they resulted from misperceptions of some relativistic claims.

Perhaps the most prominent problem characterizing work on relativity, particularly much of Whorf's work and a number of other studies in the subsequent decades, is simple circularity. This circularity is the by-product of the choice to employ one sort of linguistic data in support of a hypothesis based on another sort of linguistic data, all the while making claims about nonlinguistic behavior and thought (see discussion in Enfield [2000]). Consider Whorf's claims regarding numerous categorization-type effects, for instance the way in which water is thought of by Hopi and English speakers. English has a general word for 'water', whereas according to Whorf Hopi has two words for the relevant substance. One of these is employed for naturally occurring water (*pahe*), e.g. in lakes, waterfalls, rivers, etc., while the other is utilized when water is contained (*keyi*) in cups, bottles, ladles, and the like (1956:210). The different words for water are suggestive of differences in thought. Yet what evidence do we have for this difference of thought? We are offered nothing in this case beyond the linguistic data. If we want to convince skeptics that Hopi and English speakers actually think differently about water, however, we would need some correlation between the differences in linguistic taxonomy and actual behavior outside of language. In short, there must be testable predictions beyond the linguistic realm, and the reliance on data in the linguistic realm to support a hypothesis generated on those same linguistic data is patently circular. Furthermore, the utilization of linguistic data only runs the risk of ignoring parallel expressions that might reflect greater crosslinguistic similarity (see Kay 1996). In this case for, example, while there may be a basic cover term for 'water' in English there is also an assortment of other words that distinguish between types of water. I can, for instance, speak of "spring water" and "tap water". While both terms contain the cover term 'water', can we really be confident that English speakers do not distinguish kinds of water in fine-grained ways like that hinted at by the different terms for water in Hopi? The point here is not that they do or do not, but merely to illustrate how linguistic data alone offer insufficient support for such claims. Relativistic claims can only avoid circularity if we provide evidence for cognitive differences through some nonlinguistic behavior. Differentiated lexical encoding of a given semantic category does not reflect, *a priori*, differentiated nonlexical conceptualizations of the relevant category.

A second objection to the relativistic position is that it is particularly susceptible to confirmation bias. That is, researchers are more prone to interpret findings, even nonlinguistic data of some kind, in ways that confirm their hypotheses. Part of the reason claims related to linguistic relativity have been so susceptible to such a bias is that they have frequently been anecdotal in nature. For example, consider the example I offered above regarding the per-