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Pirahã, Language Universals and Linguistic Relativity

Nina Moffitt
Oberlin College

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Nina Moffitt
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Anthropology, Oberlin College
55 Park Place
Brooklyn, New York, 11217
nina.moffitt@oberlin.edu

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Pirahã culture constrains communication to nonabstract subjects which fall within the immediate experience of interlocutors. This constraint explains a number of very surprising features of Pirahã grammar and culture: the absence of numbers of any kind or a concept of counting and of any terms for quantification, the absence of color terms, the absence of embedding, the simplest pronoun inventory known, the absence of "relative tenses," the simplest kinship system yet documented, the absence of creation myths and fiction, the absence of any individual or collective memory of more than two generations past, the absence of drawing or other art and one of the simplest material cultures documented, and the fact that the Pirahã are monolingual after more than 200 years of regular contact with Brazilians and the Tupi-Guaraní-speaking Kawahiv [Everett 2005: 621].

Dan Everett (b. 1951) is an ex-missionary and linguist whose scholarly work of the past 30 years focuses on the Pirahã, an indigenous tribe of the Amazon who live on the banks of the Maici River in Brazil. In 2005 Everett published a controversial article entitled "Cultural Constraints on Grammar and Cognition in Pirahã" in *Current Anthropology*, in which he posited that properties of the Pirahã language are constrained by cultural values that exclude grammatical and lexical elements not immediately within the realm of personal experience (Everett 2005). Everett contends that these values constitute a cultural principle, titled the "immediacy of experience principle," centered around cultural conservation and rejection of everything abstract, foreign, or non-witnessed (Everett 2005). In his 2005 article, Everett asserts that his proposal of the absence of certain grammatical properties in Pirahã challenge the widely accepted theories of Noam Chomsky's Universal Grammar and Charles Hockett's design features of human language (Everett 2005). His claims also reopen the dialogue about the disputed Whorfian Linguistic Relativity Hypothesis, asking to what extent language and

culture influence one other. In this thesis I will place Dan Everett's work on the Pirahã in the context of these linguistic theories, criticisms and perpetual questions.

In the first section of this thesis, entitled "The Case of the Pirahã," I will provide a deeply descriptive account of Pirahã language and culture based on Everett's ethnographic reports. First I will describe Everett's work with the Pirahã and provide theories about the history of the indigenous populations of the Amazon, the origins of the Pirahã people and their language. Then I will proceed to explain Everett's hypothesis, the immediacy of experience principle, and describe pertinent features of Pirahã language. These features will include phonemic inventory, tonality, sentence forms, color terms, number, quantifiers, and recursion (or "embedding"). I will spend time particularly on those features that Everett claims to be absent in Pirahã, which are numbers, quantifiers, color terms, and recursion.

After discussing features of Pirahã language, I will describe features of Pirahã daily life, culture and customs according to Everett's reports, and how these elements are used to contribute to Everett's thesis. Features of Pirahã life and culture to be discussed include subsistence methods, patterns of sleep, rules of marriage and sex, kinship terms, oral history and cosmology, material culture, art, technology, ritual, spirits, and social control. Everett describes many of these features as relatively sparse or lacking in Pirahã culture in comparison to other cultures and indigenous Amazonian tribes, positing that some of these features require abstract thought or knowledge that is not derived from immediate experience. He then connects these features to those allegedly absent features of Pirahã language and contends that they are drawn from the same cultural principle, the immediacy of experience principle (also referred to as IEP).

In the second section of this thesis, entitled "Language Universals," I will discuss the study of language universals, recounting the work of Noam Chomsky, Joseph Greenberg, Charles Hockett, and Brent Berlin and Paul Kay. After describing Chomsky's theories of universal grammar and the significance of recursion to human language according to Hauser, Chomsky and Fitch (2002), I will explain Everett's claim that Pirahã lacks recursion, and discuss criticisms from both perspectives. Then I will explain Charles Hockett's design features of human language, three of which Everett claims are violated in Pirahã language. Finally, I will present Berlin and Kay's 1969 study of basic color terms, after which I will discuss the significance of color terms in Pirahã and the ways in which translators can interpret those terms to be present or absent in Pirahã.

The third section, entitled "The Linguistic Relativity Hypothesis," will document the historical development of the hypothesis and explain the various components of the theory, including the work of Franz Boas, Edward Sapir, and Benjamin Lee Whorf.

In the fourth and last section, called "Discussion," I will discuss Everett's methods and writing style. Everett's work is contentious among linguists and anthropologists and has received significant criticism (Replies to Everett 2005: Berlin 2005; Kay 2005, Levinson 2005, Surrallés 2005, Wierzbicka 2005; Nevins, Pesetsky, Rodrigues 2007). Everett has been criticized as lacking substantial evidence for his claims about the "gaps" or absence of features in Pirahã language as well as his claims about the root of these gaps. Each claim about a supposedly absent feature in Pirahã has been contested and is ambiguous due to differing interpretations of Everett's data. In a response to Everett's 2005 article written by Andrew Nevins, David Pesetsky and Cilene

Rodrigues (2007), most if not all of Everett's claims about Pirahã language and culture are rejected on the grounds of alternate interpretations.

While Everett has received much criticism for his methodology, translations and interpretations, many critics also focus on the implications of his claims for the Pirahã people. Everett's writing style is criticized as indelicate and at times shocking, and has been said to portray the Pirahã as primitive (Wierzbicka 2005). He is accused of exoticizing (Wierzbicka 2005) and oversimplifying Pirahã culture (Surrallés 2005, Levinson 2005), as well as exaggerating the uniqueness of Pirahã linguistic features among the world's languages (Wierzbicka 2005, Levinson 2005, Kay 2005, Berlin 2005). Furthermore, Everett's claim about the absence of recursion in Pirahã can be interpreted as dehumanizing to the Pirahã because recursion is considered a fundamental element of differentiation between animal and human communication (Hauser, Chomsky & Fitch 2002). These criticisms will be discussed in the final section of this thesis, bringing together the possible implications of Everett's work for theories of language universals and linguistic relativity, for the Pirahã people and for the field of linguistic anthropology.

In conclusion, Everett has presented an interesting and unusual case that should be studied further. I agree with Everett's statement of the importance of fieldwork in linguistic anthropology, and with his emphasis on linguistic relativity. However, I find the way in which Everett has presented his findings to be insensitive and at times inappropriate, as well as (perhaps unknowingly) representing a resurrection of the now discredited anthropological interest in the "primitive mind." Everett's hypothesis about the immediacy of experience principle is an interesting concept in theory, although I find his descriptive works to be insufficient as definitive evidence due to their limitations and

bias. While some other scientists have aimed at reevaluating these claims, such as Peter Gordon (1993), no other linguist has attained fluency in Pirahã, which makes empirical research and fieldwork challenging. Because Everett's work is one of the only sources of linguistic data on the Pirahã, further study must be conducted by other researchers in order to validate Everett's claims. At present, Everett's research serves as a vehicle for dialogue between ethnographers and theorists, causing us to revisit issues that have been at the core of the discipline of anthropology throughout history.

I. The Case of the Pirahã

DANIEL EVERETT AND THE PIRAHÃ

Daniel Everett began living with the Pirahã and studying their language in 1977. He spent seven consecutive years living with the Pirahã in the company of his family, and has returned for various lengths of time every year since. Everett started out as a missionary with the Summer Institute of Linguistics (SIL) and subsequently received his PhD at the Universidade Sao Paulo in Sao Paulo, Brazil. For years SIL missionaries who had come before Everett tried to learn Pirahã but continuously failed. Prior to Everett's arrival, missionaries Steve Sheldon and Arlo Heinlich lived and worked with the Pirahã and provided some research and notes on Pirahã grammar that aided Everett as he learned the language (Everett 2008).

In the wake of the controversy following Everett's 2005 article "Cultural Constraints on Pirahã Grammar and Cognition," linguist Tecumseh Fitch visited the Pirahã to investigate Everett's claims concerning recursion, but since he apparently could not communicate adequately with the Pirahã, his research was thwarted (Colapinto 2007: 2). Psychologist Peter Gordon conducted a study on Pirahã number and cognition in 2004 that provided important insights about the Pirahãs' perception of quantities. Everett recently replicated this study under better-controlled conditions with the help of cognitive sciences professors Michael C. Frank, Evelina Fedorenko and Edward Gibson from MIT (2008). Brazilian anthropologist Marco Antonio Gonçalves spent around 18 months over a period of several years living with the Pirahã and writing two books about Pirahã culture, and apparently accepts Everett's claims about culture and Pirahã grammar (Everett 2005, reply to comments: 642). Despite the efforts of other linguists to check

Everett's claims, however, no other linguist or non-Pirahã besides Everett has been able to achieve fluency in Pirahã (Everett 2008).

While learning and developing a system of documentation for Pirahã language, Everett was forced to use a monolingual method of data collection. Because the Pirahã are monolingual, there was no shared language in which to converse and translate words. Everett's method can be described as pointing, asking for words in Pirahã, writing down whatever response the native speaker gives (hoping it is correct), and immediately practicing the word in new contexts with other speakers. This is a way of checking a translation and expanding upon the definition of a word and its concept. Everett studied different "semantic fields" or groupings of related terms, transcribed words phonetically on index cards, recorded the context around the word and his guess as to its likely meaning. He worked these words into conversation with the Pirahãs and determined which sounds or phonemes were meaningful and perceptible to them, in order to devise a writing system. Everett essentially became fluent in Pirahã by a long process of trial and error and drawing associations between a particular phoneme and many meanings.

ORIGINS

Pirahã is a language isolate, meaning it shows no genetic relationship with any other language family or language currently spoken in the world (Everett 2008: 29). Brazilian indigenous languages are genetically diverse, with four major stocks and a few language isolates. A protolanguage, the language from which a genetic grouping of languages is descended, can be evidenced by consistent phonetic groupings and relationships shown by cognates, or words in different languages that are recognizably

related to each other (Malmkjær 1991: 193, 209). Pirahã has been demonstrated as previously belonging to the Mura-Pirahã language family, for it showed clear evidence of similarities with the now extinct Mura language. Because Mura is extinct, Pirahã is considered a language isolate, with no relation to other extant languages (Everett 2005: 622). Although many language isolates are also considered endangered, Pirahã is not considered an endangered language for this reason alone, because it is used so vigorously in a monolingual environment. According to Everett, the Pirahã have no desire to learn another language and are therefore capable of effectively preserving their language as long as the population lives (Everett 2008: 276). However, because the population of Pirahã speakers is so small, estimated to be currently about 250-380 (Nevins, Pesetsky, Rodrigues 2007), Pirahã can be considered an endangered language in the sense that the population itself is endangered (Everett 2008: 276).

There are different theories on the origins of the indigenous peoples of Latin America and specifically in the Amazon. Archaeologist Betty Meggers believes that Amazon was always the home of small bands of hunter-gatherers because the agricultural potential of the Amazon's soil was too low to sustain large civilizations, at least for prehistoric technology (Everett 2008: 28). Linguist Joseph Greenberg believes there were three waves of migration across the Bering Strait. According to his theory, the first group were "pushed" southward by the second group about 11,000 years ago, who were then forced to the south by the final group, the Inuit. The first group settled South America, and were mainly hunter-gatherers. Greenberg's evidence can be found in the relationships among both living and extinct languages of the Americas. He claims that the languages

south of Mexico are more closely related than those of central and northern North America.

According to Greenberg, Pirahã should be more closely related to South American languages, and he proposes that it is related to the Macro-Chibcha language. Everett contends that this claim is nearly impossible to evaluate, and his evidence points to the formation of both Pirahã and the now-extinct Mura dialect as a single language isolate. "However," Everett says, "It is impossible to prove that Pirahã was not related to any other Amazonian languages [besides Mura] in the distant past. Historical linguistics methods… simply do not allow us to look back far enough to say certainly that two languages never developed from a common source language" (Everett 2008: 28).

Charles Mann, an American journalist and author, wrote a book called *1491: New Revelations of the Americas Before Columbus,* in which he argued that indigenous people of the Americas were larger in number, had arrived earlier (and not only by the Bering land bridge), were more sophisticated culturally, and controlled the natural landscape to a greater degree than was previously thought. He points to evidence from the last few decades showing that indigenous populations of the pre-Columbian era set parts of the Amazonian rainforest on fire to keep clear of unwanted trees and undergrowth, for the sake of agriculture. Over centuries, this burning created an intricate ecosystem of fire-adapted plant species dependent on this burning (and forest burning is still practiced by the current inhabitants of the Beni-Bolivian providence). Mann's argument indicates a new perspective on Amazonian indigenous populations as peoples who control the land, instead of passively living among nature. He supports an image of them as sophisticated, advanced cultures since before European colonization, and also

projects an image of the Amazon as a sustainable place for complex societies to live and grow in. (Everett 2008: 29)

A pertinent question to Everett's study of the Pirahã is, where did they come from? Everett says, "The existence of language isolates like Pirahã and Mura... might be understood as supporting Roosevelt's ideas, because large amounts of time are required to sufficiently 'erase' the similarity between languages to produce a language isolate" (Everett 2008: 29). However, he suggests that the Pirahãs' extremely early isolation during the peopling of the Americas could also explain the language's isolation, by either the Roosevelt or Meggers theories. Everett concludes that we might never know where the Pirahãs or their language came from, as there is no oral history and no documentation before the time of European colonialism in 1500 (unless earlier documentation can be found).

Some evidence suggests that the Pirahã are not originally from the part of the jungle where they currently live, including the lack of native vocabulary for some species of monkeys found near the Maici river. Loan words, including the monkey *paguacu,* come from the Tupi-Guarani language family. "Since there is no evidence that the Pirahãs have ever given up one of their own words in order to borrow a word from another language, this suggests that the language had no word for this species of monkey because it wasn't found in their [previous] homeland" (Everett 2008: 29). Everett also mentions that all Pirahã pronouns "were borrowed recently from a Tupi-Guarani language," although he argues that the role of pronouns in Pirahã is "reduced" relative to other languages (Everett 2005: 628).

Upon the European arrival to the Amazon c. 1500 A.D., diseases such as influenza, smallpox, measles and others were introduced to native groups, reducing their populations dramatically. Europeans enslaved the natives and forced them to live on sugar cane plantations, and many natives fled coastal areas and moved to distant, inaccessible parts of the country such as the Amazon basin. During the 16th through 18th centuries, the Portuguese engaged in devastating, Indian-hunting bandeiras, which were slave raids or expeditions (Everett 2008, Roosevelt 1994: 9). As a result, indigenous peoples are now a small percentage of the population and the largest numbers of natives live in the north, forming around 230 different cultural groups (Encyclopedia Britannica).

Anna Roosevelt believes that the Amazon was and is capable of sustaining large settlements and civilization. She believes that *homo sapiens* has been in South America much longer than Greenberg and Meggers suggest (Everett 2008:29). She also writes about the dramatic transformation that took place in indigenous societies during the colonization of Amazonia. "Many groups had to adapt to greatly changed circumstances, some forms of society disappeared, and new ones came into being.... the invasions spelled immediate decline for some groups... complex indigenous social forms disappeared as the colonization expanded," (Roosevelt 1994: xiv). According to author Antonio Porro, "over time, paramount leaders disappeared, their realms disintegrated, and the size and number of native settlements shrank substantially as the conquest of Amazonia progressed," (Roosevelt 1994: xiv). Historical evidence for the maltreatment and forced relocation of indigenous peoples of the Amazon might provide a possible explanation for the severe geographic isolation of groups such as the Pirahã, as well as the Pirahã's alleged cultural and linguistic isolation.

PIRAHÃ LANGUAGE

According to Dan Everett, Pirahã language has many unusual features. Among these features, Everett contends that Pirahã lacks terms for numbers, quantifiers, basic color terms and embedding/recursion, that Pirahã culture possesses a simple kinship system, no creation myths, fiction, or collective memory, very little art and material culture, and is persistently monolingual despite regular long term contact with foreign languages. Everett posits that one cultural principle can explain all of these linguistic features as well as many Pirahã cultural practices, beliefs and attitudes. He calls this principle the "immediacy of experience principle," which can be defined as the constraint of communication to "nonabstract subjects which fall within the immediate experience of interlocutors" (Everett 2005: 621). In other words, according to Everett, Pirahã language lacks terms that do not relate directly to experience that is considered relevant to Pirahã culture in the present, and thus excludes abstract concepts and words or linguistic systems that are related to abstract concepts. Throughout this section on Pirahã language and culture I will present Everett's examples of how the immediacy of experience principle (IEP) allegedly operates in the Pirahãs' lives and speech.

In order to understand the limitations on conceptual thought that the Pirahã language is said to exhibit, we must first examine some of the basic structures of Pirahã. According to Everett's reports, Pirahã's phonemic inventory, or number of speech sounds, is particularly small in proportion to most other languages. Pirahã has only 11 phonemes: eight consonants and three vowels. Because of its limited number of phonemes, words in Pirahã must be longer than words in a language with more speech sounds (Everett 2008: 21) and more modes of communication must be employed in order

to differentiate between words. For example, Pirahã is a tonal language, meaning that phonemes are given relative pitches that help define each phoneme in context.

The writing system that Everett created to document Pirahã includes symbols for two relative pitches, where an accent over a vowel denotes a high tone, and lack of an accent implies a low tone. The fact that pitches are relative means that they are not fixed at a particular consistent pitch. Rather, pitches are vocalized lower or higher relative to the tone that one begins with. The tonal nature of Pirahã language, combined with its small phonemic inventory, allows for a fascinating capability: Pirahã speakers can communicate using speech sounds, but also by humming, yelling, singing, or whistling tones. (Everett 2008: 182).

> I saw that Pirahã allows an astonishing range of variation among consonants… Pirahã makes such extensive use of tone, accent, and the weight of its syllables that the language can be whistled, hummed, yelled, or sung. For example, the sentence *Káixihí xaoxaagá, gáihí* (There is a paca there) has a musical form. It is this musical form that is whistled or hummed or sung [Everett 2008: 182].

Everett proceeds to describe his method of documenting this tonality using musical notation (e.g. whole notes, quarter notes, dotted quarter notes, etc.). He states that Pirahã has five syllable lengths and two possible tones (one higher, one lower). Everett attributes each of the aforementioned five channels of discourse with a unique cultural function in Pirahã society (Everett 2008: 185). For example, "hum speech" can be used to disguise what one is saying or to have a private conversation. "Yell speech," which has only vowels and no consonants, is used to speak loudly and at long distances, or over rain and thunder. "Musical speech" is used to communicate new information and to communicate with spirits, often employed by "spirits" themselves (to be discussed in

the section on Pirahã culture). "Whistle speech" is used for hunting purposes, to disguise men as part of the environment, and in aggressive play among boys (Everett 2008: 187).

Although Pirahã language can be used to communicate over a wide variety of mediums, the language is said to employ only three forms of sentences, which are questions, declarations, or commands. Everett claims that phatic communication (a term coined by Malinowsky), which refers to language used for general social interaction rather than to convey specific meaning, does not exist in Pirahã (Everett 2008: 11). Phatic communication includes terms such as "hello," "goodbye," and "Nice morning, isn't it?" which are designed for social purposes, such as politeness and the avoidance of awkwardness, and not to convey literal messages. Pirahã does not employ this type of communication (Everett 2008: 11). In Everett's book on the Pirahã (2008), however, I did observe many instances in which Everett's English translations of Pirahã sound like phatic communication. For example, Everett relays an anecdote in which a Pirahã says "Hey Dan" to Everett (Everett 2008: 66). Upon reading this, I assumed that the translation was purposefully changed by Everett in an effort to make the dialogue more "readable" to English-speaking audiences. However, Everett's critics often point to inconsistencies like this in order to question Everett's claims (see Discussion).

COLOR TERMS

Everett contends that Pirahã lacks basic color terms and uses only descriptive phrases. These phrases liken an object to another object of similar color or describe an aspect of the object which would explain its coloration. As defined by Berlin & Kay (1991), "basic color terms" express colors as abstract entities without the use of other

terms or similes, and in their most basic form. Terms such as "crimson," "lemon-colored," or "the color of the rust on my aunt's old Chevrolet" would not be considered basic color terms, but similes or variations of a basic color term (Berlin & Kay 1991: 5). Everett has found no evidence of basic color terms in Pirahã. Rather, he has heard descriptive phrases such as "that is like blood," for the color red, "it is temporarily immature," for green, "blood is dirty," for black, and "it is transparent," for white (Everett 2008: 21). These expressions seem to be based on the context of the color or the material that houses the color, rather than any abstract concept of a color on its own. In other words, Pirahã color expressions seem to be used "as modifiers and predicates but not as substantives," (Kay 2005: 636).

NUMBERS & QUANTIFIERS

The absence of Pirahã numbers and quantifiers has also drawn significant interest from linguists (Gordon 2004; Frank, Everett, Fedorenko, Gibson, 2008). Everett posits that Pirahã has no grammatical number, counting terms, or quantifiers and that it only has terms for relative quantities (Everett 1983, 1986, 2005; Corbett 2000). In addition, the Pirahã are said not to use any external objects, fingers or body parts are used to count or tally. This is because, according to Everett, exact quantity does not exist in Pirahã. Rather, quantities are expressed by relative volume of an object: "two small fish and one medium-size fish are roughly equal in volume, but both would be less than, and thus trigger a different "number," than a large fish" (Everett 2008: 117).

Despite the fact that ordinal numbers apparently do not exist in Pirahã and are not counted using body parts or objects, body parts are sometimes used by the Pirahã to

describe the order of events in time. For example, the sentence "I was born first then my sibling was born" would be literally expressed in Pirahã as "I head fall sibling to me/there at fall," employing "head" to mean "first" in reference to "something at the beginning of a spatial or temporal sequence" (Everett 2005: 624). Everett has also said that Pirahã lacks comparatives, such as phrases like "this is big/that is bigger" (Everett 2008: 21).

Quantifiers, such as *all, each,* and *every* are also allegedly lacking in Pirahã. The closest expression to these quantifiers that Pirahã displays is variations on the morpheme "big." According to Everett, too express the sentence, "we ate most of the fish" in Pirahã, one would literally say, "My bigness ate [at] a bigness of fish, nevertheless there was a smallness we did not eat," (Everett 2008: 120). It seems as though the Pirahã use variations of "big" and "small" in a wide array of contexts in place of quantifiers. Thus, quantities are expressed vaguely or loosely, without exactitude.

Everett explains the difference between Pirahã quantifiers and those in English and other languages with the fact that the "truth conditions" of the quantifiers are different between the languages. Truth conditions are "the circumstances under which speakers will admit that a word is used correctly or not," and in languages such as English, quantifiers have strict truth conditions (Everett 2008: 121). Examples that Everett uses are the quantifiers "all" and "whole." To English speakers, these terms imply a complete quantity, or 100% of something, whereas Everett asserts that in Pirahã, completeness is not measured or expressed in language. "The point is that the truth conditions in Pirahã never include the precise, quantifierlike meaning of *all* (where *all* means "every single entity in a set") for any word in their language," (Everett 2008: 121).

When trading with river traders, Everett says, the Pirahã will point to an item or group of items that they want, and then point to an item or group of items that they will trade for it. There is never any measuring of quantity to ensure fair trade, and according to Everett, the Pirahãs often allow unfair trades as a result (Everett 2008). The consequences of not having exact quantity and numbers in Pirahã is that the Pirahã cannot maximize profit in an economic system.

In one anecdote, Everett relays a dialogue taking place during the sale of an anaconda skin. The Pirahã speaker initially projects that "the foreigner will likely buy the entire anaconda skin." The word *báaiso* [entire] is used like a quantifier, which we might interpret as "entire," "whole," or "all." After this sentence is said, a piece of the snake is taken by someone. Then it is sold, and the sentence "Yes, he bought the whole thing" is uttered by the same speaker. So the word *báaiso* is used again to describe the same anaconda with a piece missing. In English, Everett says, this would not be an acceptable use of the term "whole." For this reason, the term *báaiso* cannot be considered the equivalent of our quantifier "whole," because its definition has looser truth conditions (Everett 2005: 625).

Anna Wierzbicka, who has conducted research on semantic universals (Goddard & Wierzbicka 2002), criticizes Everett's statement on the Pirahã's alleged absence of the term "all." She claims that Everett's examples of close approximations to the quantifiers "all" and "each" count as actual quantifiers in meaning. Her criticism centers on Everett's interpretation of the term "big" as an alternative to quantifiers as opposed to as a quantifier itself.

> The fact that the same segment used in one syntactic frame can mean "big" and in another "all" misleads [Everett] into thinking that there is no word for "all" in

> Pirahã—a conclusion clearly contradicted by his own data. The concept of polysemy[1] is a basic tool in semantic analysis, and rejecting it altogether leads to ludicrous results such as the following "literal" gloss[2]: "My bigness ate [at] a bigness of fish, nevertheless there was a smallness we did not eat." In using such glosses, Everett exoticizes the language rather than identifying its genuinely distinctive features. To say that *ti 'ogi* means, literally, "my bigness" (rather than "we") is like saying that in English to understand means, literally, to stand under." To deny that *hi 'ogi* means "all" is to make a similar mistake [Wierzbicka 2005; response to Everett 2005].

Whether or not the reader interprets Everett's literal gloss as exoticizing Pirahã, I am under the impression that Everett's goal in displaying literal translations was academic in nature. In his 2008 book on the Pirahã, *Don't Sleep, There Are Snakes*, Everett often uses literal gloss in order to convey the manner in which Pirahã combines minimal parts to form complex words. In the case criticized by Wierzbicka, I believe Everett used literal gloss to reveal the Pirahã's lack of distinct terms that stand alone as quantifiers, and the fact that Pirahã employs different combinations of broadly defined morphemes, creating many meanings from a small inventory of sounds. His literal translation of "my bigness," instead of writing the English "we," serves to show the reader how Pirahã functions from a translator's perspective. The fact that the term "big" is used in many different contexts to stand in for the functions of both quantifiers ("all") and pronouns ("we") shows that Pirahã does not have a distinct terminology for those words. However, the semantic meaning of "all" seems to be communicated effectively, despite being composed of parts with broad meanings. Here the argument seems to lie in the definition of a quantifier; that is, whether a quantifier must be a unique term, or whether it can be composed of morphemes and words that have other meanings.

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[1] Polysemy: *n.* the coexistence of many possible meanings for a word or phrase. (Oxford English Dictionary)

[2] Gloss: *n.* a translation or explanation of a word, phrase, or passage. (Oxford English Dictionary)

Everett tried to teach the Pirahã basic numbers, reading and writing skills with hardly any success. His attempt to get the Pirahã to replicate plain symbols on paper failed because, Everett says, the Pirahã rejected the entire concept of a "correct" answer. He stipulates that perhaps they did not understand where "correct" knowledge came come from, and therefore rejected it. "They did not care at all that their symbols were all the same, nor that there are such things as correct and incorrect written forms. When I asked them to draw a symbol twice, it was never replicated. They considered their writing to be no different from the marks I made," (Everett 2008: 118).

> Every evening for eight months we tried to teach Pirahã men and women to count to ten in Portuguese. They wanted to learn this because they knew that they did not understand money and wanted to be able to tell whether they were being cheated (or so they told us) by the river traders. After eight months of daily efforts, without ever needing to call the Pirahãs to come for class (all meetings were started by them with much enthusiasm), the people concluded that they could not learn this material and classes were abandoned. Not one Pirahã learned to count to ten in eight months. None learned to add 3+1 or even 1+1 [Everett 2008: 118].

From these results, Everett concludes that the Pirahã do not value knowledge from outside of their culture, and uses this anecdote to support the immediacy of experience principle.

In 2004 bio-behavioral scientist Peter Gordon published an article in *Science* using Pirahã numbers to justify a strong version of the Whorfian linguistic relativity hypothesis. The premise of his argument was that the Pirahã had a "one-two-many" counting system (Gordon 2004: 496). However, Everett later translated these same terms with more vague definitions as, respectively, "small size or amount," "somewhat larger size or amount," and "cause to come together/many" (Everett, 2005). Despite Gordon's apparent error in regard to these definitions, Gordon's research set the stage for further

research by asking whether Pirahãs could conceive of larger numerosities despite their lack of language for cardinalities.

Gordon gave the Pirahãs numerical tasks in which he asked participants to match small sets of objects in various configurations. Adult Pirahãs responded accurately with up to 2 or three objects, but performances declined when given eight to ten items, and dropped to zero with larger sets. A single exception to this pattern was with tasks involving unevenly spaced objects; the Pirahãs' performance for sets of seven to ten items, unevenly spaced, was near perfect. Gordon hypothesizes that perhaps the spacing allowed participants to perceive groups of items as smaller "chunks" of 2 or three items, which they could then match to corresponding groups (Science Daily: Aug. 20, 2004, Gordon 2004).

Aside from the unevenly spaced items, Gordon's results showed that Pirahã errors generally grew larger as the quantities increased, implying that the Pirahã probably used a strategy of approximate magnitude estimation instead of representing numbers exactly. "Results of numerical tasks with varying cognitive demands show that numerical cognition is clearly affected by the lack of a counting system in the language. Performance with quantities greater than three was remarkably poor, but showed a constant coefficient of variation, which is suggestive of an analog estimation process," (Gordon 2004: 496). Gordon asserted that the results of his study supported the strong Whorfian claim that language can limit cognitive abilities (Gordon 2004: 496).

Dan Everett emulated and expanded Gordon's study with partners Michael C. Frank, Evelina Fedorenko, and Edward Gibson, with a larger sample of 14 adult speakers, seven male and seven female, as opposed to Gordon's small sample of four

males. The question posed by Frank et al. was, "does speaking a language without number words change the way speakers of that language perceive exact quantities?" In the experiment conducted by Frank et al., spools of thread were provided in increasing number until ten were present, and participants were asked how many spools were present after each increase. The same elicitation was done in decreasing order. The results revealed that only three terms in Pirahã were used to express each of the quantities of spools, and those terms were *hói, hoí, and baágiso.*

In the increasing elicitation:

- *Hói* – used to describe one object
- *Hoí* – used to describe two or more objects
- *Baágiso* – used to describe quantities of three or more.

In the decreasing elicitation:

- *Hói* – used to describe quantities up to six
- *Hoí* –quantities between four and ten
- *Baágiso* – quantities between seven and ten

As evidenced by the difference in quantities expressed by the same term in the increasing and decreasing elicitations, each term is shown to represent only a relative idea of quantity, and is not defined by fixed cardinal boundaries, or "exact quantity." "Because each of the three words was used for a dramatically different range of values in the ascending and the descending elicitations, these words are much more likely to be relative or comparative terms like "few" or "fewer" than absolute terms like "one" or even proto-numbers (numerals with approximate quantities, like "roughly one," as suggested in Gordon, 2004)," (Frank et al. 2008: 820). Ultimately, Frank et al. determined that no exact quantities can be found in Pirahã:

> We show that the Pirahã have no linguistic method whatsoever for expressing exact quantity, not even "one." Despite this lack, when retested on the matching tasks used by Gordon, Pirahã speakers were able to perform exact matches with large numbers of objects perfectly but, as previously reported, they were inaccurate on

> matching tasks involving memory. These results suggest that language for exact number is a cultural invention rather than a linguistic universal, and that number words do not change our underlying representations of number but instead are a cognitive technology for keeping track of the cardinality of large sets across time, space, and changes in modality [Frank et al. 2008: 819].

According to Everett, Pirahã is reported to lack singular-plural morphology, meaning that "there is no morphological route for representing the distinction between "one" and "many"" (Frank et al. 2008: 820). In matching tasks with large quantities, a Pirahã might have understood what was required but not have been able to perform the tasks accurately, indicating that number vocabulary is necessary for remembering large quantities exactly.

To Everett, the most surprising aspect of the Frank et al. was that the Pirahãs sometimes failed on simple one-to-one matching tasks. Everett does not think that these errors were due to misunderstandings, because extensive demonstrations and practice runs were conducted with subjects before each experiment (Frank et al. 2008: 821). "The failures of the Pirahã in the one-to-one matching task also suggested a potentially deeper, strong Whorfian claim: that without number words, human beings represent only approximate quantities, and that only by learning number words can humans create the concept of *exact* quantity: the idea that adding or subtracting even a single individual from a set will change the quantity of that set," (Frank et. al 2008: 820).

Ultimately, Frank et al. presented two Whorfian claims as possible implications for the study. The weaker claim states that language for number allows accurate memory for sets with exact cardinalities, and the stronger claim states that language for number creates the concept of exact cardinality (Frank et. al 2008: 820). The results of the Frank et al. study point away from the stronger claim and provide support for the weaker,

suggesting " a view of number words as a cognitive technology, a tool for creating mental representations of the exact cardinalities of sets, representations that can be remembered and communicated accurately across time, space, and changes in modality," (Frank et al. 2008: 820). "Thus, our experiments support the hypothesis that the concept of exact quantity is not created by language, while suggesting that the ability to remember the cardinalities of large sets is enabled by learning number words" (Frank et al. 2008: 823).

RECURSION / EMBEDDING

One language feature that is allegedly absent in Pirahã, recursion, is widely considered universal. Mark Hauser, Noam Chomsky, and Tecumseh Fitch (2002) believe it to be the most important distinguishing quality between animal and human communication. Recursion can be defined as the "embedding" of one clause inside another in a sentence (Pinker, Jackendoff, 2005). For example, the sentence "the black cat ate the rat in the garage" includes the clauses "the cat is black," "the cat ate the rat," and "this is all happening in the garage," and embeds several of those clauses inside one another (continued in the section on language universals). If no recursion existed in that sentence, each clause would have to be said separately, and one after another. Pirahã operates that way, according to Everett, because it lacks recursion within sentences.

While Everett contends that Pirahã speakers cannot embed clauses within clauses, he does argue that Pirahã employs recursion on a larger scale in its narrative structures. Instead of embedding clauses, Pirahã embeds entire sentences within a narrative. Everett believes that recursion can exist among phrases, as opposed to only syntactically (within sentences), and that the larger cognitive function of recursion is to organize entire ideas

in the thought process. For this reason, Everett posits that recursion is independent of grammar. "If recursion is not found in the grammar of all languages, but it is found in the thought processes of all humans, then it is part of general human intelligence and not part of a "language instinct" or "universal grammar," as Noam Chomsky has claimed." (Everett 2008: 94).

PIRAHÃ CULTURE

According to Everett, the Pirahã subsist on fishing, hunting, foraging, and an agricultural method introduced by previous missionaries (the planting and tilling of manioc, which is indigenous to the Amazon – see section on technology below). Pirahã men hunt, but women, children, and men all forage. Importantly, the Pirahã do not preserve food in any way except for travel, despite having the knowledge and the means to do so:

> When [Pirahãs] are about to embark for a place where they expect to encounter Brazilians, they salt meat (if they have salt) or smoke it, to preserve it. But among themselves they never preserve meat. I haven't seen another Amazonian group that doesn't salt or smoke meat routinely. The Pirahãs consume everything as soon as it is hunted or gathered. They preserve nothing for themselves (leftovers are eaten until they are gone, even if the meat begins to turn rancid [Everett 2008: 76].

Everett also describes the eating patterns of the Pirahã as irregular, due to the fact that they eat immediately upon obtaining food. Even if it's three am, Everett says, if a Pirahã returns from a fishing trip, people will wake up to eat the food immediately. Some days, he says, Pirahãs will miss a meal or not eat at all. Everett claims to have once witnessed Pirahãs dance for thee days with only brief breaks, during which no hunting, fishing, or gathering took place. In Everett's eyes, this attitude towards subsistence, including rejection of food preservation, indicates a lack of worry about the future and a

clear focus on the present. Everett uses this as an example to support his "immediacy of experience principle."

According to Everett, Pirahã sleeping patterns show the same irregularity. Everett describes an average of four hours of sleep per night for Pirahãs, with naps that range from 15 minutes to 2 hours at other times. Fishing takes place at all hours of the night, which is why the Pirahãs eat at whatever hour the fish is brought in (Everett 2008: 77). Everett also writes that there is loud talking in the village throughout the entire night, with no apparent division between daytime and nighttime activity. His primary explanation for this behavior is the necessity for the Pirahã to be constantly aware of dangers and predators of the jungle, particularly at night. As Everett understands it, the advantage seems to be that someone is always awake to defend a sleeping person from predators. Hence the title of Everett's recent book about the Pirahã, "Don't Sleep, There Are Snakes." Everett draws an analogy between the use of this expression and our "good night," but also maintains that the Pirahã expression is entirely literal as a warning. Everett also uses the Pirahã attitude towards sleep to support his concept of the immediacy of experience principle, asserting that the desire to be constantly awake indicates a desire to live in the here and now.

Boundaries of sex and marriage in Pirahã are also loose compared to many other cultures, by Everett's reports. Pirahã marriage is recognized simply by cohabitation, with no ritual and very few marital restrictions. Although "married" Pirahã couples are usually monogamous, sex is not limited to spouses. While having sex with someone else's spouse is frowned upon, it still happens, and frequently, according to Everett. A couple will go away for a few days, say, a married person and someone other than his or

her spouse, and if they return remaining together, the old couple is divorced and new couple is married, as recognized by cohabitation. While the old spouse might bemoan the absence of his or her spouse during the days that the spouse is off somewhere, no further mention or complaint takes place after the "divorce" (Everett 2008: 86).

The kinship vocabulary in Pirahã is relatively limited, and of the kinship terms that do exist, many of them have broad definitions and connotations. Everett defines Pirahã kinship terms as such: *Baíxi* (gender neutral) can mean any number of authority figures, including elder, parent, grandparent, or just someone that you want something from. It is a general sign of respect. *Xahaigí* (gender neutral) can refer either to a sibling, or any Pirahã of the same generation, or to any Pirahã in the context of differentiation from foreigners (which reminds me of the term "brother" in English as an inclusive symbol of solidarity). Everett says that this term expresses a value of community, and is both genderless and numberless. *Hoagí* or *hoísai* means "son," which literally means "to come" or "the one that came." *Kai* means daughter, and *Piihí* means "child with at least one deceased parent," "stepchild," and "favorite child," (Everett 2008: 86-87)

A common belief among anthropologists is that the more complex a kinship system is, the more restrictions exist on whom to marry. Inversely, "the fewer the number of kinship terms, the smaller the number of kinship-related restrictions there will be in a society... Since [the Pirahã] lack any word for cousin, unsurprisingly there is no restriction against marrying a cousin. And because *xahaigí* is ambiguous, I have seen men marry their half sisters," (Everett 2008: 87). An incest taboo among the Pirahã only prohibits the marriage of full siblings or grandparent/parent and child, and according to Everett, hardly any other sexual rules exist among the Pirahã. Sex is not prohibited

between children and adults as long as the children are not forced or hurt (Everett 2008: 103).

Pirahã parenting could also be considered "loose" by American standards. Pirahã children "come up" rather than being "brought up," a distinction often made between U.S. southern and northern parenting strategies, reflected in the different expressions used to describe the process of growing up. For one, Pirahãs do not talk baby talk. "Children are just human beings in Pirahã society, as worthy of respect as any fully grown human adult. They are not seen as in need of coddling or special protections," (Everett 2008: 89). Pirahã children are allowed to drink liquor with adults, get drunk, and smoke tobacco. Parents do not always protect their children from harm, because they prefer to let them learn from personal experience. For example adults will allow very young children to play with knives or wander close to a fire, and if a child gets hurt, his/her parent will scold him/her. Everett explains this behavior as a form of parental Darwinism. "The Pirahãs have an undercurrent of Darwinism running through their parenting philosophy. This style of parenting has the results of producing very tough and resilient adults… citizens of the Pirahã nation know that each day's survival depends on their individual skills and hardiness," (Everett 2008: 90).

Perhaps one of the elements of Pirahã culture that can best fit into Everett's immediacy of experience principle is the Pirahãs' lack of oral history. Everett's reports show that the Pirahã have no stories about the past and no creation myth. When asked about creation myths, Pirahãs will sometimes mention Brazilian or Tupi legends, but "do not "use" them to discuss or explain anything in the world around them or the ancient world," (Everett 2005: 633). They possess no indigenous creation myth nor any fiction

whatsoever, and when pressed about creation, the Pirahã say "'Everything is the same,' meaning that nothing changes, nothing was created," (Everett 2005: 633). To Everett, this indicates an acceptance of life as it is, and a lack of concern for the answers to the ontological questions that most other cultures anguish over. Everett describes his effect as a missionary on the Pirahã:

> When I began to tell them the stories from the Bible, they didn't have much of an impact. I wondered, was I telling the story incorrectly? Finally one Pirahã asked me one day, well, what color is Jesus? How tall is he? When did he tell you these things? And I said, well, you know, I've never seen him, I don't know what color he was, I don't know how tall he was. Well, if you have never seen him, why are you telling us this [Everett 2007b]?

Everett treats the Pirahã's immediacy of experience principle as a psychological mechanism that serves the same function as religion and philosophy. To Everett, the principle seems to enforce the "there is no answer" answer to ontological questions effectively, while dispelling any reason for asking ontological questions in the first place. It should be noted that, after Everett's 30 years with the Pirahã, Everett was converted from a devout Christian missionary to an atheist. Despite the fact that this change broke up Everett's family, Everett expresses a deeper contentment with the views of atheism he adopted, which seem inspired by the Pirahãs' cultural values. He approaches idealizing the Pirahã as he says, "I would go so far as to suggest that the Pirahãs are happier, fitter, and better adjusted to their environment than any Christian or other religious person I have ever known," (Everett 2008: 297).

Another element of Pirahã culture that Everett uses to illustrate the immediacy of experience principle is the Pirahãs' minimal material possessions and lack of permanent material culture, or things that last a lifetime (Everett 2008: 73-4). According to

Everett's reports, the Pirahã have no permanent housing structures. Both types of shelters created by the Pirahã blow over in storms, and Everett did not observe any effort to build stronger constructions that would last longer. Hand-made tools include large, powerful bows and arrows that take three days to make, for which each arrow takes approximately three hours. If a basket is needed, it is woven on the spot from wet palm leaves. Everett argues that, ""using the same skills they already demonstrated in making these disposable baskets, they could make longer-lasting baskets, simply by selecting more durable material (such as wicker). But they don't, I concluded, because they don't want them... It indicates an interest in making things as you go," (Everett 2008: 72).

In terms of art, in all of his studies, Everett could not find anything long lasting or permanent created by the Pirahã. Women and babies of both genders wear necklaces made by the women, designed both to ward of spirits and to look attractive, according to Everett. The necklaces are created from seeds and homespun cotton string, teeth, feathers, beads, and other objects, but "rarely show symmetry" and Everett calls them "crude and unattractive compared to the artifacts of other groups in the region," (Everett 2008: 74). Where Everett uses the subjective term "unattractive," I would probably use the term unconventional; completely unrelated to established art forms, common aesthetics or tradition, and totally original. Pirahã "art" may seem "unattractive" to someone who enjoys established tradition in art, but enjoyable to someone else who values spontaneous expression and unlearned art forms such as folk art. However, I think Everett's main point in calling Pirahã designs "unattractive" was to convey the fact that Pirahãs do not pass on cultural methods of design or information that would allow traditions to develop in a formulaic way across generations. This is a prime example of

how Everett's writing style is often shocking or exaggerated, and can either delegitimize his ideas or frame his intentions with negativity.

The only other example of indigenous Pirahã art that I found was in John Colapinto's article from The New Yorker. Colapinto witnessed a child with a toy plane created out of balsawood, modeled off of the plane that had brought Colapinto to the Maici River. Here is his description:

> I had my own doubts about Everett's portrayal of the Pirahã shortly after I arrived in the village. We were still unpacking when a Pirahã boy, who appeared to be about eleven years old, ran out from the trees beside the river. Grinning, he showed off a surprisingly accurate replica of the floatplane we had just landed in. Carved from balsa wood, the model was four feet long and had a tapering fuselage, wings, and pontoons, as well as propellers, which were affixed with small pieces of wire so that the boy could spin the blades with his finger. I asked Everett whether the model contradicted his claim that the Pirahã do not make art. Everett barely glanced up. "They make them every time a plane arrives," he said. "They don't keep them around when there aren't any planes. It's a chain reaction, and someone else will do it, but then eventually it will peter out." Sure enough, I later saw the model lying broken and dirty in the weeds beside the river. No one made another one during the six days I spent in the village [Colapinto 2007: 2].

Throughout Everett's accounts, Everett reiterates the Pirahãs' perceived carelessness with material objects, both with objects made by Pirahãs and those obtained by trade with Brazilian riverboat traders.

An interesting case that Everett uses to validate his immediacy of experience principle is the case of Pirahã canoes. Although Pirahãs can paddle across the river on long strips of tree bark, they prefer to steal or trade for sturdier dugout and board canoes made by Brazilians. Despite the fact that the Pirahã depend on these sturdier canoes for fishing, transportation and recreation on the river, they do not build canoes. Everett hired a Brazilian canoe builder to teach the Pirahã how to build the Brazilian dugout canoes that they depend on:

> When he arrived, the Pirahãs all gathered (enthusiastically) to learn from him. As per our agreement, Simprício let the Pirahãs do the labor, supervising rather than building the canoe directly and instructing them carefully as they worked. After about five days of intense effort, they made a beautiful dugout canoe and showed it off proudly to me. I bought the tools for them to make more. Then a few days after Simprício left, the Pirahãs asked me for another [Brazilian] canoe. I told them that they could make their own now. They said, "Pirahãs don't make canoes" and walked away. No Pirahã has ever made another *xagaoa* to my knowledge. This taught me that Pirahãs don't import foreign knowledge or adopt foreign work habits easily, if at all, not matter how useful one might think that the knowledge is to them [Everett 2008: 76].

The Pirahã also rely on imported tools such as machetes for butchering, building, making bows and arrows, and digging manioc out of the ground. The only way to acquire these types of goods is by trading jungle produce for tools with riverboat traders. Only a few villages are able to do this, according to proximity, and tools make their way down the river as other Pirahã groups trade with those villages. "In spite of how important these tools are to them, the Pirahãs do not take good care of them. Children throw new tools in the river; people leave the tools in the fields; and often they trade tools away for manioc meal when outsiders make their way in." To Everett, this behavior seems to indicate that "lack of concern for the future [is] a cultural value," and that the Pirahã "invest no more effort in something than is necessary for minimal function." He adds that it "certainly wasn't laziness, because the Pirahãs work very hard" (Everett 2008: 78-79).

According to Everett, the Pirahãs have shown no improvement in technology over time (Everett 2008: 79). "Evidence from records of the Mura and Pirahã for nearly three hundred years since contact was first made in 1714 strongly supports the conclusion that Pirahã culture has changed little since contact with Europeans" (Everett 2008: 80). One possible explanation for the Pirahãs' lack of progress in technology could be that they

adopted a policy of isolationism as a result of the trauma of contact with European colonialists in the eighteenth century. In many cases, the trauma of the colonial period led to the cultural disintegration of indigenous groups, including the loss of knowledge and cultural specializations (Everett 2008: 80). Everett leans toward the conclusion that the Pirahã became an isolationist community as a result of this trauma, rejecting the adoption of most foreign customs, language, material goods, and generally, foreign knowledge. When the Pirahã ask Everett about where he comes from, Everett says, it's largely for entertainment value, and not to gain new information.

The Pirahã do not have many observable forms of ritual, according to Everett. Although the Pirahã do bury their deceased, the tradition surrounding the burial is never consistent, but rather, loose and variable. The dead are most often placed in a sitting position with their limited belongings placed beside them (never more than a dozen), with green sticks crisscrossed above the body, which is then wedged into a hole over which broad leaves are placed. Everett interprets the burials not as ritualistic but as a practical solution to the "indelicacy" of leaving the corpse to decompose above ground (Everett 2008: 81-82).

The Pirahã frequently report spirits that are embodied by either members of the community or elements of the environment such as animals or trees. Each spirit has a name and personality, and their behavior is predictable. When a member of the community acts out a spirit, he or she embodies this personality. The spirits only recount first-hand stories or eye-witnessed experiences, and never speak abstractly. However, they do give advice, such as not to fish in a certain place, and what to avoid.

The spirits appear in dances, in which a man playing the role of a spirit claims to have encountered and been possessed by that spirit. Dances use no musical instruments, but often involve singing, clapping and stomping. According to Everett, the dances bring the village together, and are marked by promiscuity and merriment. Everett calls the dances a "weak form of ritual," because the spirits are witnessed and imitated, and have value and meaning to the community, but are not consistent or formulaic. According to Everett, spiritual encounters and dances are intended to teach Pirahãs to be strong or to know their environment, but entirely through first-hand accounts that describe events within immediate experience.

> The relative lack of ritual among the Pirahãs is predicted by the immediacy of experience principle. This principle states that formulaic language and actions (rituals) that involve reference to nonwitnessed events are avoided. So a ritual where the principal character could not claim to have seen what he or she was enacting would be prohibited... the idea behind the principle is that the Pirahãs avoid formulaic encodings of values and instead transmit values and information via actions and words that are original in composition with the person acting or speaking, that have been witnessed by this person, or have been told to this person by a witness. So traditional oral literature and rituals have no place [Everett 2008: 84].

Everett reports that the Pirahã are egalitarian, the way that many American Indian societies are by tradition (Everett 2008: 110). Social control, therefore, comes not from coercion, but from group ostracism and spirits. Coercion, an idea emphasized by Émile Durkheim, involves laws that coerce individuals into following conduct that is beneficial and not harmful to society. Everett reports that he never witnessed any Pirahã exercising authority over another, nor reprimanding another for his or her deed. Instead, Everett asserts, social control among the Pirahã is exercised using ostracism, including exclusion from food sharing, and the admonishments of spirits (Everett 2007b).

Another example of the immediacy of experience principle in Pirahã daily life is their lack of, or very sparse material culture and lack of currency. To Everett, he fragility and impermanence of Pirahã housing structures indicates the absence permanent foundation as a cultural value, and an implied belief that all things of the world are transient. Everett posits that the Pirahã do indeed have the means to create more permanent structures, using material and construction methods that would make houses, canoes, or objects last longer, but that they do not seem to desire more permanent constructions. In other words, Everett contends that the Pirahã *prefer* to build houses that blow over in a storm, and prefer to rebuild them time after time, as opposed to simply constructing them with more sturdy materials the first time.

The canoe is one of the most puzzling examples that Everett uses to describe the Pirahã rejection of permanent construction. After the Pirahã displayed competence in building Brazilian canoes, they subsequently rejected the knowledge in favor of purchasing Brazilian-made canoes, with the statement "Pirahãs do not make canoes." (Everett 2008, 76). With this story, Everett implies that the decision not to construct permanent or long lasting material objects is born from a cultural value, and not any kind of incompetence.

Upon reading this about the canoes, my question was, how do young Pirahãs initially learn that "Pirahãs do not make canoes"? Where does the value of material transience, or rather, the lack of value for permanent structures, come from? Everett's theory is that this reasoning can be explained by the immediacy of experience principle, which must be culturally learned, and that it dictates all aspects of Pirahã life.

In conclusion, here is a summation of the examples Everett provides throughout his ethnographic descriptions that are used to demonstrate his concept of the immediacy of experience principle:

Pirahãs do not store food but eat it immediately after it is gathered or hunted, regardless of the time of day. Time itself seems relatively unquantified, daily activities do not seem necessarily structured around the time of day, according to Everett's description of Pirahã hunting and sleeping habits. Pirahãs do not sleep for the entire night, and sometimes miss meals. Similar to the canoe story, baskets are weaved on the spot when needed. Art is destroyed after short usage, despite how difficult it might have been to create or obtain the art. Personal possessions are very few. Marriage is flexible. The rules about sex in the community are few. Kinship terms have multiple meanings and interpretations. Pirahã society is reportedly egalitarian, leaving no opportunity for social hierarchy, dominance, power, or wealth. Everett's portrayal provides the impression that each individual in the Pirahã community sees him or herself as an inevitably transient entity, and that this self concept is not negative, but accepted as neutral.

Understanding how Everett connects these cultural patterns to his "immediacy of experience principle," provides important insight into Everett's theory about the alleged "gaps" in Pirahã language. Given the cultural values and practices discussed above, Everett believes that Pirahã is "constrained" by the same cultural principles, necessarily excluding ways of speaking that do not conform to those principles.

II. Language Universals

"Over all, the study of language universals aims to establish limits on variation within human language." (Malkmkjær 1991 quoting Comrie 1989: 33-4)

CHOMSKY, UNIVERSAL GRAMMAR, & RECURSION

Two main approaches have been taken to study language universals, which can be seen in the work of Joseph Greenberg and Noam Chomsky. In the study of language, linguists differentiate between I-language and E-language. I-language can be defined as "internalized knowledge incorporated in the brain of a particular speaker," and E-language as "language viewed as a shared social phenomenon external to the mind," (Collinge 1990: 307). Noam Chomsky focuses on I-language and ignores E-language, establishing universals "on the basis of careful, detailed analysis of one or a small number of languages," (Malkmkjær 1991: 278). Rather than taking a large sample from a number of languages, Chomsky used his native language, English, to generalized about the biological functions behind the grammar of all languages.

The Chomskian approach to universals is one of nativism, biology, and genetics. Chomsky's groundbreaking work on universal grammar, *Syntactic Structures*, was first published in 1959. In it Chomsky detailed his emerging concept of generative grammar, a set of rules that could "generate' all of the possible sentences of a language (Ottenheimer 2006: 83). This grammar worked from the deep, abstract structures of sentences to produce a surface structure. Chomsky's concept of "deep structure" refers to an underlying grammar beneath the process of producing a sentence, while surface structure referred to actual sentences produced. The rules that dictate how deep

structures are created are called "phrase structure rules," referring to the order in which phrases can fit with each other in a sentence, such as noun phrases, verb phrases, and prepositional phrases.

Thus, Chomsky's concept of universal grammar can be defined as, "the surface structure of any language is explained with reference to certain highly abstract features which are shared by all languages because they are innate in humans," (Malkmkjær 1991: 278). In other words, a "deep structure" can be found inherent in all languages, which provides the fundamental biological function to create grammar out of sounds provided by one's environment, or "stimulus." The Chomskian mindset can be described as such:

> Chomskians see the study of language as a means of exploring the human mind. They explore language as a phenomenon internal to speakers, rather than as a social phenomenon. Innateness is justified as an explanation for universals on the grounds that the evidence children have available through the language they hear around them is insufficient for them to develop the complex, abstract grammar which underlies any language [Malkmkjær 1991: 278].

Chomsky uses human language acquisition as a means of supporting his innateness hypothesis. "Children end up using the language correctly and creatively, that is, they produce not only sentences which they have heard before, but also new sentences which, once the acquisition process is complete, are invariably grammatical," (Malkmkjær 1991: 278). Chomsky reasons that if humans were not innately structured to produce only grammatical sentences, they might produce new sentences that were ungrammatical. But children consistently produce grammatical sentences that they have never heard before. Even children who are still in the process of learning language produce very few mistakes violating the principles of Universal Grammar. Because these principles are too abstract for a small child to learn from a parent or teacher, Chomsky reasons that these grammatical principles must be innate. (Malkmkjær 1991: 1991)

Among Chomsky's many critics, Geoffrey Sampson opposes Chomsky's view of language as stemming from biology because he views language as a part of culture, or as a "cultural institution," affected largely by environment as opposed to biology.

As previously mentioned, recursion, or embedding, is "the embedding of one clause inside another in a sentence," (Pinker, Jackendoff 2005), or "putting one phrase inside another of the same type or lower level, e.g., noun phrases in noun phrases, sentences in sentences, etc." (Everett 2005: 622). With the property of recursion in language comes the formal property of "discrete infinity," which can be described as the ability to embed within sentences at infinite length. Hauser, Chomsky and Fitch define the property in this way:

> The Core Property of discrete infinity is intuitively familiar to every language user. Sentences are built up of discrete units: There are 6-word sentences and 7-word sentences, but no 6.5 word sentences. There is no longest sentences(any candidate sentence can be trumped by, for example, embedding in it "Mary thinks that..."), and there is no non-arbitrary upper bound to sentence length. In these respects, language is directly analogous to the natural numbers... At a minimum, then, [the Faculty of Language – Narrow Sense] includes the capacity of recursion [Hauser, Chomsky & Fitch quoted in Nevins et al. 2007: 9].

Therefore, Everett's claim that Pirahã lacks recursion implies that the inventory of possible sentences one can create in Pirahã is finite, while most other languages that possess recursion can create an infinite number of infinitely long sentences.

Chomsky, Hauser, and Fitch suggest that syntactic recursion is the only aspect that is unique to both humans and language, "the rest of language being either specific to humans but not to language (e.g. words and concepts) or not specific to humans (e.g. speech perception)," (Pinker, Jackendoff 2005). Pinker and Jackendoff explore which aspects of language are uniquely human and uniquely linguistic, and they conclude that Chomsky's hypothesis about recursion being the only such factor is problematic.

> It ignores the many aspects of grammar that are not recursive, such as phonology, morphology, case, agreement, and many properties of words. It is inconsistent with the anatomy and neural control of the human vocal tract. And it is weakened by experiments suggesting that speech perception cannot be reduced to primate audition, that word learning cannot be reduced to fact learning, and that at least one gene involved in speech and language was evolutionarily selected in the human lineage but is not specific to recursion [Pinker, Jackendoff 2005].

If Chomsky, Hauser, and Fitch suggest that syntactic recursion is the only element that is unique to both humans and language, and Pirahã does not possess syntactic recursion, then it would follow from Chomsky, Hauser, and Fitch's hypothesis that Pirahã is not a human language. This is one very controversial aspect of Everett's research. First, his claim that Pirahã does not have recursion indicates an enormous difference between the linguistic capacities of Pirahã and languages with recursion. To some readers, this might suggest that Everett sees the Pirahã as less culturally and linguistically evolved than other cultural groups.

> Brent Berlin noted that the grammatical feature of recursion has been correlated with cultural complexity, quoting Givón's work on "pragmatic" and "syntactic" modes of speech that "reflect changing functions of language with cultural evolution, leading him to conclude that 'certain types of languages—those which have only coordination ('clause chaining') but no subordination—are found only in preliterate 'societies of intimates'" [Givón 1979 quoted in Berlin 2005: 635]. However, Pinker and Jackendoff argue that since Pirahã has all grammatical elements that distinguish human communication from that of animals, it is undoubtedly a human language, and an exception to Chomsky's rule about recursion.

> Recursive possession (my father's brother's uncle), are conveyed in Pirahã by means of monoclausal constructions connected paratactically (i.e. without embedding). However, Pirahã very clearly has phonology, morphology, syntax, and sentences, and is undoubtedly a human language, qualitatively different from anything found in animals [Pinker & Jackendoff 16].

In the reply to Everett's 2005 article in *Current Anthropology*, Andrew Nevins, David Pesetsky and Cilene Rodrigues (2007) write, "We find no evidence… that Pirahã

lacks embedded clauses, and in fact find strong syntactic and semantic evidence in favor of their existence in Pirahã" (Nevins, Pesetsky, Rodrigues 2007: 1). They base most of their claims on Everett's 1987 dissertation from the Universidade Estadual de Campinas in Brazil and on the ethnographic work of Brazilian anthropologist Marco Antonio Gonçalvez (1993; 2001). Nevins et al. claim that evidence for linguistic diversity does not disprove Chomsky's theory of universal grammar, because universal grammar is not influenced by culture. Rather, they explain, universal grammar is a structure that is innate to every human being, upon which a cultural environment can build any type of language.

> "Universal Grammar" is nothing more than a name for the human capacity for language, an aspect of our genetic endowment. The very existence of linguistic diversity teaches us that a given individual's personal linguistic abilities and behaviors reflect not only UG but also that individual's linguistic experience (in ways that UG itself circumscribes). Imagine we learn that aspects of some individual's linguistic experience were shaped by the culture of the community in which the individual grew up (surely a truism). In such a case, we may have learned something interesting about linguistic experience or about culture, but we have not necessarily learned anything about UG (much less about the design features for language) [Nevins, Pesetsky, Rodrigues 2007: 4].

Therefore, Nevins et al. consider universal grammar to be a reality regardless of variations in the way that it is phenotypically expressed (Nevins, Pesetsky, Rodrigues 2007: 4). By this logic, recursion would exist in the brains of every individual, but would not be expressed by the languages of some cultures. In answer to Everett's claims, Nevins et al. seem to imply that the Pirahã do have the capability for syntactic recursion, but their language may or may not utilize this capability. However, Everett seems to want to reject the importance of syntactic recursion as a defining feature of human language, using the Pirahã as an exception to disprove the rule (Everett 2005: 634).

GREENBERG's UNIVERSALS

In the 1950's, American linguist Joseph Greenberg (1915-2001) examined a large number of languages in wide geographic and genetic distribution and located potential universals, as well as many cross-linguistic tendencies. 30 languages were sampled, including Basque, Serbian, Welsh, Norwegian, Modern Greek, Italian, Finnish, European, Yoruba, Nubian, Swahili, Fulani, Masai, Songhai, Berber (African), Turkish, Hebrew, Burushaski, Hindi, Kannada, Japanese, Thai, Burmese, Malay (Asian), Maori, Loritja (Oceanic), Maya, Zapotec, Quechua, Chibcha, and Guaraní (American Indian) (Malkmkjær 1991: 279). Mass comparative research like Greenberg's is necessarily limited to the study of languages that are available to present observation (not past, extinct languages, and not future languages). According to Greenberg, there are several important methods for how to choose the languages to represent in a mass comparison study. Selecting a wide range of genetic language families will dispel the idea that shared properties are universal when related by language family. Wide geographical distribution will avoid the possibility of influence of shared language traits due to proximity. Finally, there should be variability in language "type," according to distinctions of language typology (Malkmkjær 1991: 277-284) Greenberg admits, "without much more complete sampling of the world's languages, the absence of exceptions to most of the universals asserted here cannot be fully assured" (Greenberg 1963).

The approach that Greenberg invented as a means of determining and defining linguistic universals in a study is called the "implicational approach." Using this method, each language universal is implicational by nature, implying "given x in a language, we always find y." The implicational method is a means for testing a linguistic hypothesis

scientifically, using an empirical approach, as opposed to one that is purely theoretical.

Using the implicational approach, Greenberg proposed 45 universals of three kinds: word order universals, syntactic universals, and morphological universals. Of the word order universals, Greenberg proposed a Basic Order Typology that is now widely used by linguists to describe the relative order or the subject, object and verb in declarative sentences of a language. Of the six possible orders, (SVO, SOV, VSO, OSV, OVS), only three normally occur as dominant orders, VSO, SVO, and SOV, in which the verb either comes before the subject and object, between them, or after both of them. The implicational universal tendency Greenberg proposed, therefore, is as follows: "In declarative sentences with nominal subject and object, the dominant order is almost always one in which the subject precedes the object," (Greenberg 1963).

There are two types of strengths that can be attributed to language universals, which are indicated by the terms "universal tendency" vs. "absolute universal." A universal tendency would be determined using the implicational approach, and seen in most languages, but not necessarily all, and is subject to exceptions. An absolute universal, on the other hand, is seen as necessarily universal to all languages. "All languages have vowels" is an example of an absolute universal, since no language has yet been discovered as lacking vowels. (Malkmkjær 1991: 282) On the other hand, "nearly all language have nasal consonants" is an example of a non-implicational tendency, which is stated bald-on but is acknowledged as having exceptions. The universal "all languages have at least three persons and two numbers" is explained from the point of view of discourse pragmatics: the necessity of having three persons in a language allows speakers to make referential distinctions, which aids in communication. However, it should be

noted that "it is often not possible to establish for certain whether a universal is absolute or just a strong tendency" (Malkmkjær 1991: 282).

HOCKETT'S DESIGN FEATURES

In 1960, American linguist Charles Hockett proposed 13 design features of human language, which increased to 16 design features in 1968, distinguishing human language from animal communication (Ottenheimer 2006: 177-181, 182, Hockett and Altmann, 1968). These design features are as follows:

1) Vocal auditory channels: Language can also exist in visual and written forms, but many linguists consider sound, or voice and hearing, to be the primary means of communication among humans. 2) Broadcast transmission and directional reception: while the sounds of human language are sent out in all directions, listeners perceive the sound as originating in a particular direction. 3) Rapid fading: sounds used in communication do not last very long, or fade rapidly. 4) Interchangeability: the ability to send and receive the same message. This also implies that any human can repeat any sentence said by another human. 5) Total feedback: the ability to hear and internalize a message one has sent. 6) Semanticity: speech sounds linked to specific meanings. 7) Arbitrariness: there is no direct connection between the signal and its meaning. 8) Discreteness: each unit of communication can be separated and unmistakable. 9) Specialization: speech is produced only for communication, and does not serve another function (Ottenheimer 2006: 177-181).

10) Displacement: the ability to discuss things not physically present. This includes real things that are physically absent in the present, such as a person living on

the other side of the world, as well as different time frames, such as the past or future. This also includes abstract concepts and fiction. 11) Productivity: the ability to create new messages using existing signs. This is considered a key feature of human language. Noam Chomsky illustrated this principle with the sentence, "Colorful green ideas sleep furiously," which exemplifies the human capability to formulate grammatical sentences from completely original ideas that need not make sense. This ability allows us to speak in metaphor and abstract, poetic language. The point is that human beings can create an infinite number of sentences using a finite inventory of speech sounds (Ottenheimer 2006: 177-181).

12) Traditional transmission: the learning of language occurs in social groups. 13) Duality of patterning: meaning signs (words) are made from meaningless parts (sounds, letters). 14) Prevarication: the ability to lie/make false statements. 15) Reflexiveness: language can refer to itself. 16) Learnability: speakers of one language can learn to speak another (Ottenheimer 2006: 177-181).

Dan Everett has claimed that the Pirahã language violates three of Hockett's universal design features: interchangeability, displacement, and productivity (Everett 2005: 621). In regard to interchangeability, Everett reasons, "to the degree that Pirahã lacks a concept of counting, it is incommensurate in that semantic or cognitive domain with languages that have such a concept," (Everett 2005: 633). In other words, Everett claims that Pirahã lacks interchangeability because it is not mutually translatable with languages that have number and counting systems.

However, Andrew Pawley asserts that Everett has "misinterpreted" Hockett's definition of "interchangeability." Pawley says that Everett "takes "interchangeability"

to mean "intertranslatability"—that what can be said in one language can be said in any other. Hockett (1958:578) defines "interchangeability" as a relation between speakers and hearers: any speaker of language X can understand what someone else says in X and can say the same things," (Pawley 2005, response to Everett 2005). Pawley goes on to say that natural languages are not usually completely mutually translatable due to cultural differences.

Pawley also claims that Everett has misinterpreted Hockett's definition of "productivity," which he says Everett links to "interchangeability." Rather, Pawley says, Hockett defines productivity as "being able to say things that have never been said before," (Pawley 2005, comment on Everett 2005). Finally, Pawley says that while Pirahã speech allegedly exhibits one degree of displacement, he feels uncomfortable with the claim that Pirahã is incapable of expressing further displacement. Pawley believes that Pirahã has "considerable apparatus for talking about non-immediate experience but that there is a strong cultural preference not to do so." He adds that in order to assess claims about Pirahã using only one degree of displacement, considerable examination would have to be done using a well-founded scale of abstractness (Pawley 2005).

BERLIN & KAY: BASIC COLOR TERMS

In 1969, Brent Berlin and Paul Kay conducted what is now a famous study of universal color vocabulary, entitled *Basic Color Terms: Their Universality and Evolution.* Their study used color vocabulary to understand the full range of meaning that a word can embody. Some cultures include non-colorimetric information in their color terms, and one of Berlin & Kay's goals was to discover the extent to which this

non-colorimetric, culturally learned information factored into the definition of each basic color term. In other words, they wanted to see how each culture in the study defined and distinguished colors from one another (Berlin & Kay 1969).

A "basic color term," as defined by Berlin & Kay, is the simplest, most pared-down form of word that expresses the most "basic" form of a color. In English, basic color terms include red, orange, yellow, blue, green, and purple. A basic color term is monolexemic, meaning it is not predictable from the meaning of its parts. Its signification is also not included in that of any other color term, its application must not be restricted to a narrow class of objects, and "It must be psychologically salient for informants. Indices of psychological salience include, among others, (1) a tendency to occur at the beginning of elicited lists of color terms, (2) stability of reference across informants and across occasions of use, and (3) occurrence in the idiolects of all informants," (Berlin & Kay 1969: 6).

Data was collected from 20 languages from a number of unrelated language families, along with writing samples, which together comprised 98 diverse languages. Participants were given a board of paint chips and asked to identify all of the chips that fell within the range of each color term in their vocabulary. Then participants were asked to identify a single chip as the locus of the most intensely representative hue of each color. Surprisingly, the results found the loci to be similar cross culturally among cultures who shared some of the same terms (Berlin & Kay 1969: 5).

Most importantly, the results of Berlin and Kay's study showed that while different languages encode different numbers of basic color categories, "a total universal inventory

of exactly eleven basic color terms of any given language are always drawn," (Berlin & Kay 1969). While some languages only have two basic color terms, and some languages have five, the order in which those color terms appear is consistent across all languages. In other words, when one color is found in a language, all of the colors preceding it in the established order should be present also. If a culture has only two color terms, those terms are white and black. The order can be shown as such:

[white, black] > [red] > [green or yellow] > [yellow or green] > [blue] > [brown] > [purple, pink, orange, or gray] [Berlin & Kay 1969].

Berlin and Kay's research "strongly indicates that semantic universals do exist in the domain of color vocabulary." They go further to posit, "these universals appear to be related to the historical development of all languages in a way that can be properly termed evolutionary," (Berlin & Kay 1969: 1) Berlin and Kay attributed this order of color terms to an order of linguistic development, and to the order in which the human eye can detect color in the electromagnetic spectrum.

As previously explained, Everett has asserted that Pirahã has no basic color terms. Instead, he contends that Pirahã expresses colors using descriptive phrases, defying a trend that is widely considered universal. Paul Kay's response to Everett's 2005 article on Pirahã grammar and cognition stated that "Pirahã color expressions convey immediate sensations, not abstract concepts," and that "given the Pirahã concern with concrete, immediate experience... I believe that their actual presence [referring to basic color terms] would support his broader claims regarding Pirahã predilection for immediate experience," (Kay 2005, response to Everett 2005). Kay goes on to discuss the Pirahã

expression for green/blue, translating as "immature" or "temporary," which the missionary Steve Sheldon found to be widely shared among the Pirahã as meaning "green-or-blue with a focus in green" (Kay 2005). He points out that it is fairly common for languages to associate the color term for green with "unripe" or "immature" vegetation, and that in some cases, this shared word can also be considered a basic color term.

Kay then makes the distinction between Sheldon's way of writing the expression for green, as a single word, with Everett's way of writing it, as separate words. While Sheldon viewed the expression as a basic color term, Everett interpreted the expression as an inconsistent descriptive phrase in more than one word. He says, "my account predicts that in Pirahã colors will be described by phrases according to each experience rather than given variable-like names," (Everett 2005, reply to critics). Everett also brings to our attention the fact that Pirahã color expressions often contain the word "like," creating a simile, such as "like blood" (red), or "like water" (blue). This violates one of Berlin & Kay's (1969) requirements for the definition of a basic color term, that "its application must not be restricted to a narrow class of objects," such as blood or water.

In reference to the Berlin & Kay requirements that color terms must have "stability of reference across informants and across occasions of use, and (3) occurrence in the idiolects of all informants," (Berlin & Kay 1969), Kay points to Sheldon's research, which had claimed that the Pirahãs agreed upon color terms. However, Kay explains that Sheldon admitted a flaw in the study; the Pirahãs had consistently consulted among one another before providing answers, despite being asked to complete the study individually. Everett asserts from personal experience that Pirahãs "frequently disagree on the

description of colors," and that "moreover, different phrases can be used by the same speaker to describe the same color in the same situation," (Everett 2005a). Finally, both Kay and Everett agree that Sheldon's research on color terms had poor experimental controls, and that the experiment would need to be replicated in order to determine whether members of the Pirahã community actually agreed upon the same color terms/expressions consistently.

III. Linguistic Relativity Hypothesis

HISTORICAL DEVELOPMENT

The linguistic relativity hypothesis proposes cognitive interactions between language, thought and reality, a strong version of the hypothesis being that "certain properties of a given language have consequences for patterns of thought about reality," (Lucy 294). The historical development of the hypothesis can be dated to the first century with St. Augustine (354-430), who proposed that language is mere nomenclature for antecedently existing concepts (Gumperz & Levinson 1996: 4). In the late 17th and early 18th centuries, Locke, Condillac, Diderot, Hamman, and Herder furthered the concept. Their concerns were both theoretical and methodological, investigating the reliability of language-based knowledge in religion and science, as well as practical and social, concerning European efforts to consolidate national identities and cope with colonial expansion (Lucy 1997: 293).

In the 19th century, Homboldt (1767-1835) from Germany developed the related concept of "Weltanschauung," meaning unique worldview, of each language. He used this concept to assert the superiority of inflectional languages, a blatantly racist claim that the speakers of these languages were more culturally and mentally advanced (Lucy 1997: 294). De Saussure contributed to the linguistic relativity hypothesis with early 20th century structuralism, particularly with his concept of *valeur,* "wherein an expression picks up distinctive meaning through its opposition to other expressions... the content of linguistic expressions depends on the system in which they are embedded." "Since no two linguistic systems or subsystems are ever identical, ...Linguistic relativity more or less follows" (Gumperz & Levinson 1996: 4).

Finally, in the early 20th century, Edward Sapir and Benjamin Whorf emphasized the firsthand study of languages and rejected "hierarchical, quasi-evolutionary rankings of languages and cultures" (Lucy 1997: 294). Before Boas, Sapir and Whorf, there was a marked lack of direct empirical research on the topic of language and thought. John Lucy proposes that this was partly due to the interdisciplinary nature of the subject, combined with increasing disciplinary specialization in the fields of the social sciences. Some academics also worried that accepting linguistic relativism would undermine the conduct of the social sciences (Lucy 1997: 294). The hypothesis had the potential to delegitimize its field, since the question of whether each language requires different thought processes also calls into question whether anthropologists of one culture can effectively understand their subjects of other cultures (and languages). Another fear about linguistic relativity was that it would open the door to ethical relativity, providing reasons to excuse unethical activities by attributing them to cultural relativity. Still others equated the entire concept of linguistic relativity with absolute linguistic determinism, the strongest form of the hypothesis implied by Whorf in some of his later writings (Lucy 1997: 294). Absolute linguistic determinism implied limits to freedom of thought, framing language as a box that encloses the mind (Gumperz & Levinson 1996: 22).

APPROACHES

As previously stated, the linguistic relativity hypothesis holds that certain properties of a given language have consequences for patterns of thought about reality. First, "language embodies an interpretation of reality and language can influence thought about

that reality," and second, "each language involves a particular interpretation [of experience and reality], not a common universal one," (Lucy 1997: 294-5). This particular interpretation is a result of language guiding cognitive activity, as well as the beliefs and behaviors that depend on it.

In linguist John A. Lucy's 1997 article on the linguistic relativity hypothesis, Lucy detailed three approaches to empirical research on the hypothesis. A structure-centered approach begins with an observed difference in the structure of meaning between languages and tries to interpret behavior as influenced by language structure (Lucy 1997: 296). Examples of the structure-centered approach include studies of temporal marking and number marking in language. In the 1930's, Benjamin Whorf compared Hopi & English vocabulary for time. His argument stated that English speakers treat cycles of time with the same grammatical framework that they treat objects. "English speakers treat these cycles as object-like, as though they can be measured and counted just like tangible objects that have a form and substance," while Hopi speakers treat time cycles as recurrent events. While the Hopi do have terms for temporal cycles, such as days and years, their formal grammatical structure does not allow for an "abstract" notion of time (Lucy 1997: 296).

In 1992, John Lucy conducted a structure-centered, comparative study of the relation between grammatical number marking and cognition among speakers of American English and Yucatec Maya. He observed that in English, plurals are obligatory, whereas in Yucatec, plurals are optional. The Yucatec Maya use numeral classifiers, which occur in many languages, particularly East Asian languages. Lucy also found that English speakers show preference for shape-based classifications, whereas

Yucatec speakers show preference for material-based classifications.

Domain-centered approaches, by contrast, begin with the domain of experienced reality and seek how languages encode or construe it. Speakers of different languages are asked to refer to "the same" materials or situations in order to assess how each language would handle a different referential problem. The goal is for the comparison to reveal the distinct way in which each language functions (Lucy 1997: 298).

The study of color categories provide examples of the domain-centered approach. Eric Lenneberg et al. (Brown & Lenneberg 1954, Lenneberg 1953, Lenneberg & Roberts 1956) showed that some colors were more codable than others in English, and later, in Zuni. The more codable colors were recognized and remembered more readily in nonlinguistic tasks. As previously discussed, Berlin & Kay continued the study in 1969, which Kay & McDaniel then continued in 1978. These studies showed that a small number of "basic" color terms emerge in many languages and that these patterns stem from biological sources. Such results were thought of as evidence against the linguistic relativity hypothesis. However, Lucy posits that the studies were evidence for constraints on linguistic diversity, and not relativity. "Addressing linguistic relativity would require assessing the impact of differences in color term systems on cognition," (Lucy 1997: 300).

Behavior-centered approaches "begin with an encounter with a marked difference in behavior, usually one that is initially inexplicable but which the researcher comes to believe has its roots in a pattern of thought arising from language practices," (Lucy 1997: 301). In 1981 and 1984, Alfred Bloom conducted studies on counterfactual reasoning between Chinese and English speakers. In 1993, 1995 and 1996, Alimen and Hiltunen

studied the effects of language on occupational accidents between Swedish and Finnish speakers. Perhaps the most famous study with a behavior-centered approach was Whorf's 1956 well-known examples of patterns of speech contributing to accidental fires.

BOAS

Both Edward Sapir and Benjamin Lee Whorf drew heavily on the work of Franz Boas (1858-1942) and his ideas about linguistic relativity. Boas' primary concern was to "break away from racial and evolutionary conceptions of culture" by arguing for both the "psychic unity of mankind" and a "notion of distinct cultures and culture areas, each to be studied on its own terms," (Lucy 1992: 11). He explains this paradox by saying that while variations among languages reflect the divergent historical experience of the speech community, the "psychic unity of man" is reflected by universals across languages (Lucy 1992: 14): "The occurrence of the most fundamental grammatical concepts in all languages must be considered as proof of the unity of fundamental psychological processes," (Boas 1966: 67 quoted in Lucy 1992: 14). Thus, language illustrates the beauty of mankind as one biological species but many cultures and "races."

Boas presented three arguments about the nature of language. First, he said, languages classify experience (both lexical and grammatical elements of language) (Lucy 1992:12, Boas 1966). Second, different languages classify experience differently (Lucy 1992: 12). "In various cultures these classifications may be founded on fundamentally distinct principles," (Boas 1965: 190 quoted in Lucy 1992: 12). He provided examples of how one experience would be rendered differently between languages and how a set of experiences would be grouped differently by various languages.

The most famous example of the different ways that language expresses experience, provided by Boas, is of the Eskimo words for snow: "Here we find one word, *aput*, expressing SNOW ON THE GROUND; another one, *qana*, FALLING SNOW; a third one, *piqsirpoq*, DRIFTING SNOW; and a fourth one, *qimuqsuq*, A SNOWDRIFT," (Boas 1966: 21-22 quoted in Lucy 1992: 12). The fact that Eskimo languages have completely separate terms for something that is generally expressed with one word in English means that Eskimos think of snow in different ways than we do. By the examples provided, we can see that the terms for "snow" are determined by the different forms that snow can take, which may be more useful to differentiate for a population constantly surrounded by snow. Boas asserts that the grammatical categories used in a language are different cross-culturally, saying "Many of the categories which we are inclined to consider as essential may be absent in foreign languages, and...other categories may occur as substitutes" (Boas 1966: 38 quoted in Lucy 1992: 13). Boas' example of snow terms is one of the first influential examples of how culture and environment affect language and thought.

Third, Boas asserted that linguistic phenomena are unconscious because of their automatic production (Lucy 1992: 13). "The linguistic classifications never rise into consciousness, while in other ethnological phenomena, although the same unconscious origin prevails, these often rise into consciousness, and thus give rise to secondary reasoning and to re-interpretations," (Boas 1966: 63 quoted in Lucy 1992: 13). Essentially, while language classifies experience, speakers remain unaware of this process because of the highly automatic nature of language.

SAPIR

Edward Sapir essentially "reversed Boas' claim that linguistic classifications reflect thought and argued rather that organized linguistic classifications channel thought," (Lucy 1992: 19). Sapir first argued that thought arises from an interpretation of language classifications. "Thought may be defined as the highest latent content or potential content of speech," (Sapir 1949: 14-15 quoted in Lucy 1992: 19). Second, Sapir argued that this process of reading into linguistic categories interacts with the "formally complete" nature of language to create a systematic reconstitution of reality (Lucy 1992: 20).

> Once abstracted from experience, [language categories] are systematically elaborated in language and 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 [Sapir, 1964: 128 quoted in Lucy 1992: 20].

Essentially, Sapir asserts that we understand experience in terms of language categories which, through their abstraction, no longer correspond to experience directly (Lucy 1992: 20).

In regard to the question of how much language influences thought and culture, as opposed to how much thought and culture influence language, Boas leaned towards the former as a more powerful force. "It seems very questionable in how far the restriction of the use of certain grammatical forms can really be conceived as a hindrance in the formulation of generalized ideas. It seems much more likely that the lack of these forms is due to the lack of their need," (Boas 1966: 60 quoted in Lucy 1992: 14).

Boas seemed to reject the stronger version of the linguistic relativity hypothesis, absolute linguistic determinism, which views language as a box controlling and constraining the mind. "Presumably the language alone would not prevent a people from

advancing to more generalized forms of thinking if the general state of their culture should require expression of such thought," (Boas 1966: 63, 1965: 181-183 quoted in Lucy 1992: 14). Thus, while Edward Sapir saw in language a "powerful shaping factor," arguing that "the use of this tool transforms and, in part, constitutes conceptual thought," Boas thought that language primarily reflected thought and culture, only occasionally having direct influence on them (Lucy 1992: 23-4).

WHORF

Benjamin Lee Whorf (1897-1941) was trained as a chemical engineer at MIT, and then worked as a fire-prevention engineer for Hartford Insurance Company. He produced descriptive works on the modern Nahuatl (Aztec) and Hopi languages, historical reconstructions of Uto-Aztecan and adjacent language families, epigraphic studies of Mayan and central Mexican hieroglyphic writings, and other descriptive and theoretical works (Lucy 1992: 25).

Following Boas, Whorf believed that language classifies experience, that language classifications vary across languages, that they are out-of-awareness, and that language classifications undeniably influence thought. Whorf showed how linguistic analogies associated with the linguistic classifications of experience "embody conventional compromises necessary for speech" and provide a way for different meanings to influence one another (Lucy 1992: 62). In other words, analogies used in language to interpret experience can sometimes allow for multiple meanings, which, when confused, can misguide a cognitive interpretation of external reality.

This idea was drawn from Whorf's experience as a fire prevention engineer as he

investigated the way that individuals are led into fire-causing mistakes "by drawing plausible (in the sense of grammatically founded) yet situationally inappropriate inferences from lexemes that have multiple meanings," (Lucy 1992: 62). Whorf also employed other examples from his comparative studies of Hopi and English to show how speakers illustrate concepts characteristic of their cultures as they follow the implications of their language's grammatical patterns. While Whorf's examples did not "prove" the theory of linguistic relativity, they showed its relevance to our day-to-day life and activities, and the possible consequences of the relationship between language and thought. He also pointed the way towards further empirical study of this relationship.

EVERETT'S CONCLUSION

At the end of Everett's 2005 article, *Cultural Constraints on Pirahã Grammar*, Everett reveals the implications of his study for the field of linguistics. All of these implications are based the linguistic relativity hypothesis, finding their strength in the idea that culture and language influence one another. When Everett contends that Pirahã language defies three of Hockett's universal design features, he defies the idea of an established set of universal qualities that human language can possess. He then goes on to reason that, if he is correct about the lacking features of Pirahã grammar, then the influence of language and culture on one another is strongly evidenced, and several implications follow:

1. If culture is causally implicated in grammatical forms, then one must learn one's culture to learn one's grammar, but then, contra Chomsky (2002), a grammar is not simply "grown" [Everett 2005: 633].

It is worth mentioning that Everett uses the term "learn" to refer to the process by which individual humans develop language, while Pinker (representing Chomsky's

views) uses the term "acquire" (Pinker 1994). This difference in terminology represents the differing viewpoints of Everett and Chomsky on the nature of human language and the way that human beings develop it. While Chomsky and Pinker believe that humans acquire language via a biological mechanism that encodes language using a universal "deep structure" in the mind, Everett believes that the "structure" of language that each human learns is more heavily dependent on the cultural environment in which that human grows up. Hence, Everett uses the expression "learn language" to emphasize the impact of culture on grammatical structure and cognitive thinking, whereas Chomsky and Pinker employ "acquire language" to downplay the influence of culture and environment on language, and emphasize the inevitability, heredity and biological nature of language cognition.

Everett implies that if his claims about Pirahã culture influencing grammar are correct, then Chomsky's theory about how language is "acquired" is weakened.[3] He means to say that if his study can prove that culture does indeed have an impact on grammar, then grammar cannot be considered only biological and innate, but also subject to cultural differences. In other words, Everett means to say that there is no universal grammar inasmuch as there is no universal culture. Everett clearly defines language as an aspect of culture, placing this importance over all of the genetic features of language faculty.

The second implication for the field of linguistics that Everett writes in his 2005 article pertains directly to the linguistic relativity hypothesis:

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[3] (Everett uses the term "grown" interchangeably with Pinker's "acquire").

> Linguistic fieldwork should be carried out in a cultural community of speakers, because only by studying the culture and the grammar together can the linguist (or ethnologist) understand either [Everett 2005: 633].

This implication seems to be another call for greater importance to be placed on the linguistic relativity hypothesis in all fieldwork. The idea is that language and culture are one and the same, for our purposes, because language is simply the verbal (or visual) expression of all aspects of a culture, created within the shape of a particular cultural lens, and inseparable from that lens. Everett is saying that to study either language or culture without the other is to miss a very large portion of meaning behind it, leading to an incomplete conclusion and unfounded generalizations.

Everett's next implication, however, is more of a direct assault on linguists who have conducted cross-cultural mass comparison studies:

> 2. Studies that merely look for constructions to interact with a particular thesis by looking in an unsophisticated way at data from a variety of grammars are fundamentally untrustworthy because they are too far removed from the original situation. Grammars, especially those of little-studied languages, need an understanding of the cultural matrix from which they emerged to be properly evaluated or used in theoretical research [Everett 2005: 633].

This seems to point straight at linguists like Joseph Greenberg who have conducted mass comparisons of grammatical features without conducting ethnographic study of the cultures associated with those languages. Again, Everett proclaims that this type of study is invalid because it does not include the culture in its study of language, and can therefore produce erroneous results. Finally, the third implication provided by Everett states,

> 3. Particulars can be as important as universals. This is so because each culture-grammar pair could in principle produce tensions and interactions found nowhere else, each case extending our understanding of the interaction of culture and grammar [Everett 2005: 633].

Here Everett is arguing for both linguistic and cultural relativity. He says that the "particulars" of each language, which set that language apart from other languages, can illuminate the idiosyncratic results of culture-grammar interactions. This statement takes a somewhat postmodern focus, leaning towards the idea that each culture is unique and can only be studied via fieldwork.

IV. Discussion

The case of the Pirahã is compelling because it reopens perpetual questions about language, cognition and culture. These questions include the extent to which language and culture influence one another, the extent to which language is universal and the extent to which it is relative. It appears that Everett has set out to answer these questions using a single extreme example, Pirahã's linguistic features. He encourages the reevaluation of currently accepted language universals in the field of linguistics, and in general, Everett aims to deemphasize the study of universals and emphasize ethnographic research. Overall, it seems like Everett is fighting for nurture over nature as the primary influence on language. Perhaps this is a retort to the prevailing linguistic theories that emphasize the biological roots of language. Ironically, while Everett fights for nurture and relativism as the primary influence on language, his writing style unwittingly subscribes to anachronistic ideas of "primitive thought" and cultural evolution, which fall on the nature side of the argument.

It seems that in all of Everett's efforts to contradict the theories of Chomsky and Hockett, Everett has exaggerated the uniqueness of some of Pirahã's linguistic features among the world's languages. Critics have attested that the alleged absence of color terms, numbers, and embedding are not unique to Pirahã, nor are the absences of genealogical depth and visual art; in fact, the absence of simpler forms of these features is common to small-scale indigenous societies (Berlin 2005, Kay 2005, Levinson 2005, Surralés 2005, Wiezrbicka 2005, Nevins, Pesetsky, Rodrigues 2007).

Critics have also questioned the reasoning behind the apparently absent features of Pirahã (Surrallés 2005, Pawley 2005). In other words, some critics have suggested

that there are multiple possible sources for these phenomena, and that Everett's theory of the immediacy of experience principle is not necessarily a correct or accurate source. Surrallés (2005) points out that in the case of the Pirahã, historical conditions, as opposed to language, are more likely the root of a constraint on thought. In light of the history of the Amazon, particularly the period of colonization discussed in section I, historical conditions are a likely factor in the severe geographical isolation of the Pirahã, and perhaps in the Pirahã's linguistic and cultural isolation as well.

Pawley (2005) also questions the manner in which Everett expresses the phenomenon of the linguistic constraints. He posits that even if Everett's immediacy of experience principle is an accurate representation of Pirahã values and does exercise constraints on what the Pirahã talk about, it does not necessarily follow that these values are transmitted primarily through a grammatical structure. Pawley states,

> [This constraint] reflects a universal cultural-cum-linguistic tendency for conventional concepts to get lexicalized; people develop streamlined ways of saying familiar things. Whether constraints on what it is conventional to say are a matter of grammar, lexicon, or idiomaticity depends on how one chooses to define these constructs [Pawley 2005: 638-639].

In other words, Pawley asserts that a cultural value such as the immediacy of experience principle could potentially be transferred not through a formalized grammatical structure, but through a naturalized speaking habit acquired over generalizations.

Despite the disagreement over Everett's claims regarding linguistic theory, the most controversial aspect of Everett's work lies in its implications for the Pirahã people. While his actual claims about recursion have been considered dehumanizing to the Pirahã, Everett's writing style has also revealed a sense of superiority and patronization towards the tribe. On the first page of Everett's 2005 article on Pirahã grammar and

cognition, Everett preemptively protests against the accusation that he portrays the Pirahã are "primitive:"

> No one should draw the conclusion from this paper that the Pirahã language is in any way "primitive." It has the most complex verbal morphology I am aware of and a strikingly complex prosodic system. The Pirahã are some of the brightest, pleasantest, most fun-loving people that I know. They absence of formal fiction, myths, etc., does not mean that they do not or cannot joke or lie, both of which they particularly enjoy doing at my expense, always good-naturedly. Questioning Pirahã's implications for the design features of human language is not at all equivalent to questioning their intelligence or the richness of their cultural experience and knowledge [Everett 2005: 621].

First, in response to this statement, Brent Berlin points out that complex verbal morphology and prosody are "also typical of the languages of small, local societies with simple cultures," which he seems to think diminishes Everett's argument against accusations of primitivism. Second, the words Everett subsequently uses to describe the Pirahã, "brightest, pleasantest, most fun-loving" are adjectives for personality traits, and do not seem to pertain to his defense against association with primitivism. These words only seem to defend against the embarrassing assumption that individuals of small-scale societies lack those personality traits. In addition, these adjectives hardly relate to the Pirahã's cognitive or linguistic abilities, and can be viewed as a subjective observations. In my mind, Everett's use of these adjectives works against him as a distraction from the issues at hand. This remark also provides an example of one of many claims made by Everett about the nature of the Pirahã people that lacks relevant or substantial evidence to support it.

Anna Wierzbicka asserts that regardless of Everett's disclaimers, the content of his research implies an alignment with "the long tradition of 'primitive thought,'" (Wierzbicka 2005).

> Everett insists that the Pirahã language is not in any way "primitive," but the fact of the matter is that without a word (or wordlike element) meaning "all" speakers could not make generalizations. Accordingly, despite his protestations, Everett *is* presenting Pirahã as "primitive" language [Wierzbicka 2005, comment on Everett 2005].

Brent Berlin supports Wierzbicka's perspective by pointing out that the absence (or simple form) of certain language features, such as counting terms, color terms, syntactic subordination and perfect tense have been linked to lower levels of cultural complexity.

> These features, among others, are commonly marked in the languages of societies considered culturally complex in terms of standard measures such as those of Carneiro (1970), Murdock and Provost (1973), Naroll (1956), Hays (2000), and Marsh (1956)... [Everett's] general hypothesis can be traced to much of the nineteenth- and twentieth-century literature on the languages of so-called primitive peoples [Berlin 2005, comment on Everett 2005].

Stephen Levinson also claims that Everett echoes primitive thought by portraying the Pirahã primarily in negative terms, showing more of what is lacking in Pirahã than explaining how it works and how thoughts *can* be communicated in such a linguistic system. He criticizes Everett's compliments towards the Pirahã at the end of Everett's 2005 article as arriving too late:

> Having made the Pirahã sound like the mindless bearers of an almost subhumanly simple culture, Everett ends with a paean to "this beautiful language and culture" with "so much to teach us." As one of the few spokespersons for a small, unempowered group, he surely has some obligation to have presented a more balanced picture throughout [Levinson 2005, comment on Everett 2005].

In response to these criticisms, Everett states that the critics themselves are projecting primitivism onto Everett's research (and concurrently onto the Pirahã people) because of the critics' own ethnocentric views of what is considered primitive.

> [Surrallés'] objection, (shared by Levinson), that I have portrayed the Pirahã as primitive in thought is ethnocentric. That language does not avail itself of

> grammatical resources used in other languages neither renders it inferior to other languages nor, as Levinson claims, makes its speakers 'mindless' [Everett 2005a].

Here Everett uses the concept of cultural relativity to defend himself against any and all possible accusations made about his work.

After reading Everett's work I have come to the conclusion that Everett does not intend to objectify the Pirahã as the primitive end of a linear cultural evolution paradigm. I do hypothesize, however, that Everett's education as a missionary has engrained in him some patronizing ideas about small-scale societies that are reflected in his writing style. Granted, Everett has since rejected his duty as a missionary and rejected religion altogether, and Everett does not exercise authority over the Pirahã or force them to believe in Christianity. However, his first linguistic training, and therefore his first impressions about language, came from SIL and are inevitably grounded in missionary ideology.

If the purpose of a Christian missionary is to deliver "truth" to a pre-literate society, this notion presumes that a missionary (and entire religious institution) knows best about what will benefit the society, over and above the beliefs of that society's people. The missionary institution teaches its missionaries to act on a community with authority and enact radical changes in thinking. While Everett does not exercise this role anymore with the Pirahã, Everett can be seen as exercising a missionary role over the scientific community. He aims to enact radical changes in thought among linguists, perhaps because he believes that his own experience with linguistic relativity is closer to the "truth" about language than the established linguistic theories.

Everett made several life changing discoveries during his time with the Pirahã, particularly concerning religion and cultural/linguistic relativity. Perhaps Everett feels

that when he previously adhered to Chomskian universal grammar during his time at SIL, the theory prevented him from fully understanding Pirahã grammar by preeminently directing his research to fit the Chomskian framework. Perhaps he drew an emotional connection between his education as a missionary and his education as a Chomskian linguist. Everett's simultaneous rejection of those two schools can provide a possible explanation for some of his fervently exaggerated language, as he made such a dramatic change of beliefs. So perhaps Everett feels that he has a duty to help other Chomskian believers discover the impact of culture on grammar, so they do not become caught in what Everett perceives to be an ethnocentric way of thinking about human language.

Despite Everett's desire to educate the linguistic community about linguistic relativity, his own concept of relativity seems slightly askew. When Everett uses language that approaches patronization to describe the Pirahã, he expresses these views as objective observations. Take his quote above, in response to Surralés and Levinson, as an example. Instead of hearing the negativity in his description of the Pirahã, he attributes all value judgments to the reader, or the person interpreting his observations. Using cultural relativity as a shield, Everett essentially claims in the quote above that all judgment of the Pirahãs' lifestyle is relative (Everett 2005a). Perhaps this reveals Everett's own blindness to the biases of his linguistic schooling, allowing him to commit indelicacies (almost certainly unintentionally) in his portrayals of the Pirahã.

In sum, I believe that Daniel Everett's ethnographic research has made an important albeit provocative contribution to the study of linguistic relativity and the relationships between language, cognition, and culture. While critics have observed many areas of Everett's research to be contentious and ambiguous, the data he collected

will surely be useful to future study, and his theory has provoked deep thought on tough issues. However, Everett's writing can be made an example of the consequences of insensitive language choice, and can serve as a basis for dialogue on the responsibilities of ethnographers for small-scale societies. The case of the Pirahã language, as Everett interprets it, can be considered an exception to Chomsky's notion of syntactic recursion as the cornerstone of human language faculty, but should not necessarily warrant the rejection of syntactic recursion as a general trend among the world's languages. In other words, an exception does not necessarily disprove a rule. On the other hand, exceptions to the rules, or cultural particularities, are crucial to research concerning linguistic relativity, and should continue to be studied in great depth for the sake of our ever-expanding knowledge of human nature.

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