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The Sapir-Whorf Hypothesis

1. Statement of the hypothesis:

The relationship between language and culture, or language and world view, has been noted at least since Wilhelm von Humboldt (1836). The discussion remained relatively dormant until the 'Golden Age of Native American Indian Linguistics' in the first half of this century.

Although everyone calls it the Sapir-Whorf hypothesis, its most persistent proponent was Whorf (Carroll 1956). However, perhaps surprisingly, the most popular formulation comes from Sapir.

1.1 Sapir's, or the Lexical Version

Sapir never looked for the interface between language and culture, anywhere

but in the lexicon. The quote below is used most commonly to characterize the Sapir-Whorf hypothesis:

> "Human beings do not live in the objective world alone ... but are very much at the mercy of the particular language which has become the medium of expression for their society. The worlds in which different societies live are distinct worlds, not merely the same world with different *labels* attached" (Sapir in Mandelbaum 1963:162, emphasis added).

A similar statement stressing the classificatory or categorizing nature of language is expressed in even stronger term by Whorf though this quote is seldom used to characterize the hypothesis:

> "We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face..." (Whorf in Carroll 1956:213)

Both quotes are close in spirit and emphasize the words or lexical resources of a language. That is, both quotes stress that while nature is continuous human beings cut nature into discrete categories and each culture does the cutting somewhat differently. People make up words or concepts in order to talk about their world or cultural universe.

This version of the Sapir-Whorf hypothesis is one of two alternatives. I call this first the lexical version.

While we could ascribe the 'anomaly' that the hypothesis is usually characterized by the first, or Sapir's, quote to some historical accident there seem to exist deeper reasons that will soon become apparent.

1.2 Whorf's, or the Grammatical Version

The view expressed by Whorf in the second quote (above) is relatively unusual. He searched for the interface between language and culture beyond the vocabulary (or the lexicon) and sought to discover the roots of cultural regularities in a language's grammar:

> "...the grammar of Hopi bore a relation to Hopi culture, and the grammar of European tongues to our own 'Western' or 'European' culture" (Whorf 1939:73).

(The Hopi Indians live in villages in Arizona and speak a

language of the Uto-Aztecan language family), .and

> "By 'habitual thought' and 'thought world' I mean more than simply language, i.e., than the language patterns themselves" (Whorf in Carroll 1956:147).

(following the usage of the times we can equate 'language patterns' with grammar),and again,

> "...the background linguistic system (in other words the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impression, for his synthesis of his mental stock in trade."(Whorf in Carroll 1940:212)

Finally, in the statements in which Whorf gives the Sapir-Whorf hypothesis its alternate name, he again sees the relationship of language and culture in grammar.

> "... the 'linguistic relativity principle,' which means, in informal terms, that users of markedly different grammars are pointed in different evaluations of externally similar acts of observations, and hence are not equivalent as observers but must arrive at somewhat different views of the world"(Whorf in Carroll 1940:221).

These quotes represent the second way of interpreting the Sapir-Whorf hypothesis—the grammatical version.

1.3 Discussion

The two versions of the Sapir-Whorf hypothesis, or the 'linguistic relativity principle,' namely, the lexical version, espoused by Edward Sapir, and the grammatical, the predominant view of Benjamin Lee Whorf, have created considerable mischief in the profession. The reasons for the confusion lie in the different definitions of language used by anthropologists and linguists.

To anthropologists it was self evident that the lexical resources of a language are part of that language. Therefore, the anthropological definition of language, at least implicitly, consists of phonology, grammar (syntax), **and** the lexicon.

The definition of language used by linguists explicitly excludes the lexicon. To this day linguists tend to give the lexicon short shrift. The science of linguistics considers only those parts of language amenable to analysis that are

structured. One can easily detect pattern (i.e. structure) in phonology and in grammar (syntax). The lexicon was perceived as a 'collection of idiosyncratic features' (Gleason 1962), therefore not amenable to scientific analysis, and therefore outside of linguistics proper and, in the end, outside of what linguists considered to be language (perhaps best stated as 'language is what linguists do'). H.A. Gleason summarizes this view when he says that lexicography is something that cannot be done but must be done.

Several conferences in the 1950's (Hoijer 1954, Hymes 1960, McQuown 1960) remained strangely inconclusive, largely because participating anthropologists and linguists operated with a basic misunderstanding about the nature of language. These conferences demonstrated vividly Kuhn's (1962) notion that discussions between members subscribing to two different scientific paradigms (views of the world) are always inconclusive. The irony of these discussions is that they are about language and world view, though Kuhn (ibid) demonstrates that all world view disputes are hampered by the same sounding words used with different senses (e.g., 'language' as used by linguists versus anthropologists).

The Sapirean formulation of the hypothesis gained wide acceptance. The influence of grammar on world view was difficult to demonstrate. Whorf's exotic interpretations of Hopi thought were often attributed to his imaginative native consultant (Carl F. Voegelin, personal communication. Most of Voegelin's later work, with Florence M. Voegelin, dealt with the Hopi Indian language and culture, (e.g., Voegelin & Voegelin 1957).

Meanwhile the basic linguistic attitude changed form an orientation that 'every language has to be described on its own terms' (the structuralist paradigm) to a preoccupation with language universals ushered in by Chomsky's transformational/generative revolution in linguistics. Suddenly all languages looked very similar.

Many more or less serious statements were made to this effect. Robert E. Lees is attributed with asserting that 'all languages are dialects of English.' A few years later James McCauley 'corrected' Lees assertion by declaring that 'all languages are dialects of Japanese.' McCauley's remark was prompted by the surface structure

of Japanese which appeared to be very close to a universal, hypothetical deep structure valid for all languages.

The interdependence of a culture and the lexicon that speakers associate with that culture to talk about their experiences seems almost obvious—especially to anthropologists. The validity of the hypothesis was, of course, of much greater interest to anthropologists than to linguists and found, concurrent with the Chomskian revolution but independent of it, expression in the New Ethnography (see below).

In 1970 Oswald Werner demonstrated that the contribution of grammar to world view can only take place through grammatical categories. However, grammatical categories are, in the prevailing theories of linguistics, inherently part of the lexicon—specifically of lexical entries· In transformationalist theories of language these lexical entries are in the semantic component of the grammar of specific languages. Each entry of the form (C,P) has a conceptual part C—a representation of the 'meaning'—and a phonological part P—representing directions for pronouncing the entry. Therefore, the 'linguistic relativity principle' becomes an investigation of the relationship between a culture and its associated lexicon—including grammatical categories.

It may be useful to recapitulate briefly Werner's (1970) argument. His demonstration starts with the Chomskian assumption that the parts of a grammar are known and can be represented by the formula:

(i) $G\ (\#, \hat{}, \rightarrow, S, V_{nt}, V_t)$

where the # symbol represents the boundary conditions of a sentence (or utterance). This is the silence (absence of speech) that precedes and follows every sentence. The ^ symbol stands for the operation of concatenation. The rewrite symbol —> (right arrow) stands for the rewrite operation that specifies structure, for example, the formula

(ii) $S \rightarrow NP\hat{}VP$

(read: "rewrite sentence as consisiting of a noun phrase followed by a verb phrase") specifies the structure of S, the sentence, that consists of a noun phrase followed by a verb phrase. Thus, S in (i) stands for

sentence, V_{nt} for the non-terminal vocabulary of the grammar, such as NP and VP in (ii), and V_t for the terminal vocabulary. These lowest level units of a grammar or grammatical categories have no further structure (no rewrite rules can be applied and therefore these symbols never appear on the left side of any rewrite rules). In the process of sentence generation or production actual lexical entries replaced terminal vocabulary items in each language in question (For details of the rules governing lexical insertion into terminal grammatical categories see the publications of Noam Chomsky). Typical terminal categories are "mass noun," "count noun," "performative verb,""manner adverbial," "definite article," etc.

Obviously, #, ^, and —> are part of the formalism of all grammars, hence language universals, and cannot therefore contribute to meaning and world view.

The high level non-terminal vocabulary V_{nt} are assumed by linguists to be also universal, that is, they occur in every language and cannot therefore influence language specific world views. Languages such as Nootka (one of a large number of unrelated Native American languages spoken on the Northwest coast of the North America) which consists almost entirely of verbs and Sierra Miwok (one of a large number of unrelated Native American languages spoken in the state of California), which consists almost entirely of nouns can be made to conform to the structure of noun phrases and verb phrases naturally. In Nootka nouns are formed by nominalising verbs (English analogue: to walk—to take a walk) and in Sierra Miwok verbs are formed by verbalizing nouns (English analogue: table—to table (e.g., a motion))

The above argument leaves only the low level non-terminal (V_{nt}) and the terminal (V_t), the lowest level of grammatical categories of a given language as potential contributors to language specific aspects of world view.

If we now add M.A.K. Halliday's principle of "delicacy," that states that when the limit of linguistic analysis (the ultimate delicacy of

analysis) is reached every lexical item in every language represents its very own unique grammatical category.

The parts of grammar that could contribute to world view are therefore the low level non-terminal and the terminal grammatical categories. But since these are part of the lexicon, in any language, the interaction of language and culture must be seen as firmly rooted in the lexicon.

Ultimately, therefore, the Sapirean definitions and the definition of the hypothesis in Whorf's first quote of this article prevail. In the other, the Whorfian formulation, every time he mentions 'grammar,' or 'pattern,' these terms should be read as standing for 'low level grammatical categories,' or 'language specific grammatical categories.'

2. The Contribution of Grammatical and Lexical Categories

How then do these language specific categories contribute to world view?

Before answering this question I have to discuss two additional notions: the strong version of the Sapir-Whorf hypothesis, according to which language **determines** thought, and the weak version, according to which language has a tendency to influence thought. Whorf is often viewed as representing the strong version. However, a review of his quotes (for example in section 1.2) reveals that he always qualifies his assertions.

While Whorf does say that speakers of different languages *"must arrive"* at different interpretations of the world, these interpretations are not totally different only *"somewhat different"* (Whorf in Carroll 1956:221). Hopi grammar does not determine Hopi culture only *"bore a relation to [it]"* (Whorf 1939:73). And the *"background linguistic system"* is not a determiner of ideas but merely a *"shaper of ideas*." He talks about *"habitual thought"* rather than thought fully determined by the language of the speakers. It is thus difficult to find representatives of the strong version of the hypothesis.

All other points of view, including Whorf's, represent relatively stronger or relatively weaker versions of the weak version of the cultural relativity principle. The Sapir-Whorf hypothesis can therefore be paraphrased as follows:

> *The categorial system of every language, including lower level grammatical and all lexical categories, points its speakers toward somewhat different evaluations of externally similar observations. Hence speakers of different languages have somewhat different views of the world, somewhat different habitual thought, and consequently their language and cultural knowledge are in a somewhat different relationship to each other. They don't live in the same world with different labels attached but in somewhat different worlds. The more dissimilar two languages are, in their lexicon , that is, in conceptual and grammatical categories, the greater their tendency to embody different world views.*

Finally, Whorf's search for traces of world view in grammar, or in grammatical categories, is not without merit considering that different parts of language tend to change at different rates. Thus lexical items referring to objects change fastest as technology and customs changes. For example, in our culture new words like "jeep," "radar," "laser," "napalm", "frozen yogurt," "yuppie," and many other are quickly adopted into every day use.

Verbs seem to change slower. For example, until 1957 only planets, comets, and meteorites could orbit. Since Sputnik, the Soviet Union's first artificial satellite, an assortment of objects propelled into space are in orbits. A few years ago a telescope could not be thought of as orbiting. However, today with the Hubble Deep Space Telescope in orbit we have .extended the range of the verb even to human beings. For example, today almost every one understands the sentence "The astronauts are orbiting the earth." There are other verbs introduced or extended by the rapid changes in our culture. For example, "I word processed all morning," "this program is good at error trapping," etc. Not too surprisingly, verb examples are harder to think of than new nouns.

Still rarer are examples of changes in low level grammatical categories. These aspects of language change slowest and have therefore a much more lasting influence on 'habitual thought.'

In the following sections I use the amended definition of the Sapir-Whorf

hypothesis (above) to explain a number of anomalies in the relationship between language and culture.

2.1. Role of Different Symbol Systems

This definition still contains some mystification. How is it that different categorial systems, i.e., different languages, lead to somewhat different world views?

It is an established fact, attributed to the Hungarian mathematician George Polya, that the choice of a symbol system is crucial to the solution of a mathematical problem. A solution may be easy, difficult, or impossible dependent on how a problem solver symbolizes the problem. Mathematical problems are not identical with human problems for which language may provide a symbolization, however, mathematical problems display many similarities to such problems. Language provides human beings with categories of thought (see below the arguments of Lucy & Shweder 1988) and these may or may not facilitate thinking in a cultural domain.

We know form the Ethnoscience movement of the 1960's and 70's that speakers of different languages do classify things often very differently. For example, the Navajo Indians classify the plant world as follows:

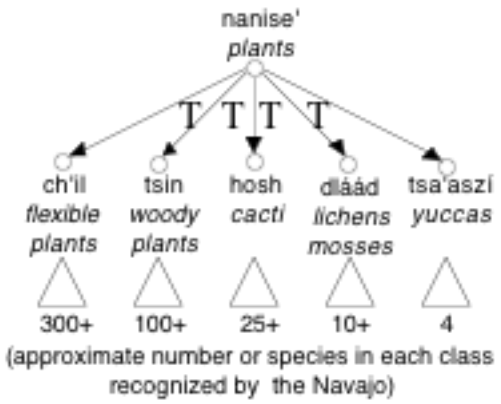

Figure 1. Navajo Classification of Plants

The T's symbolize the taxonomic relationship e.g., 'hosh nanise' át'é,' or 'A cactus is a (kind of) plant.'

It is clear from this graph that Navajos use different criteria for classifying plants than speakers of English. Strangely, in Navajo,with about 500 named plants, there does not seem to exist any further sub-divisions even of the largest class of flexible plants.

However, alternate classifications do exist. One Navajo medicine man classified all plants according to their use. The surprise was a sub-class of dangerous plants that were poisonous. However an even greater surprise was that each dangerous plant had an antidote plant that can undo the effect of the poison.

One more unusual example showing that a language can make talk (and solutions?) on some topics easy. The Navajo language has a rich vocabulary describing the 'behavior' of lines. I list only half a dozen examples from a growing corpus of about one hundred:

dziVgai [1]	a white line running off into distance (infinity)
adziisgai	a group of parallel white lines running off into distance
hadziisgai	a white line running vertically upward from the bottom
t	to the top of an object
aheVeVhesgai	more than two white lines form concentric circles
afch'inidziVgai	two white lines coming together to a point
aVfnaVnaVgah	white line zigzagging back and forth

The ease with which Navajos talk about the 'behavior' of white and other colored lines is amazing. This facility with 'geometry' is perhaps explainable by Navajo names or descriptions of features of the landscape that rarely utilize similarities to every day objects (e.g., Hat Rock). Instead Navajos use geometrical description of verticals, horizontals, lines and points. For example, a rock formation near Tuba City, Arizona, called by Navajos TseV AVheV'ii'aVha,V 'two rocks standing vertically parallel in a reciprocal relationship to each other' was named by English speakers 'Elephant's Feet.'

3.2 Language and Culture do not Co-vary

The 'perfect' correlation of different cultures speaking different languages

1. V following a vowel marks the vowel high toned while the unmarked vowel is low toned.

was an artifact of the biases of early cultural anthropology. In the formative years of the profession each ethnographer selected his or her own tribe with a distinct language. Nevertheless, anomalies to language/culture homogeneity were soon noted.

Three small tribes in Northern California present the paradigm case. The Yurok, Karok and Hupa Indians (The Yurok language is distantly related to the Algonquian, Karok to the Siouxan, and Hupa to the Na-Dene (Athabascan) language family) in the Klamath and Trinity river valleys near the California-Oregon border speak three different languages belonging to three different language families, yet their cultures are almost identical The linguistic record is incomplete, but there is evidence that many lexical categories (and possibly grammatical categories) were converging in the three languages. For example, all three use the phrase "fish eater" for naming the sea otter.

There is growing evidence that extensive language and cultural leveling is common in areas were speakers of very different languages live in close proximity and in intimate contact with each other. For example, on the border of the Indo-European and Dravidian languages of India there are communities where vocabulary and grammar of the two languages (Marathi, Indo European and Kannada, Dravidian) converge to such a high degree that people do seem to live in an identical world with different labels attached (Gumpertz 1958).

In other words, very different languages can, over time, under the influence of their converging cultures, level many of their differences. While similar languages may diverge over time if their cultures are developing in very different direction.

An example of the latter case are the Apachean languages of the US Southwest. The Navajo Indian language, in the Apachean group, accommodates a culture that incorporates many Puebloan traits into its world view. None of the Apachean speaking tribes live in villages. The Puebloan villagers have relatively homogeneous cultures but speak a diversity of languages. The other Apacheans did not incorporate these elements into their culture. Navajo and the other Apachean languages do remain similar, but the Navajos use extensive specialized vocabularies (and folk theories) appropriate to their world view that is alien to the other Apacheans.

2.3 Language Mixing

Bilinguals when in each other's company tend to mix languages. The reasons seem obvious. There are many things that can be said better, more efficiently, in an aesthetically more pleasing manner, in one language than in another. Language purity is usually maintained only in the presence of (especially) high status monolinguals who would consider mixing the discourse with an unknown language offensive.

Language mixing, a universal occurrence among bilinguals in each others company, is a good indicator of the utility of the idioms or technical vocabulary of one language over another. That is, different languages offer different (more or less elegant?) solutions to speech about the same or similar cultural things.

3.2 Language Acquisition

In the debate about the relationship of language to culture scholars used a numeber of connectives. Since all definition of culture stress that culture includes all things that "... were acquired [learned] by man as a member of society" (Tylor 1871). Thus any language that is learned by children belongs therefore within culture. This fact underlies the formulation of the relationship as 'language **in** culture.'

However, many scholars were concerned that language is not just 'in culture' or 'part of culture,' but is also the major vehicle for the acquisition of culture. The confusion of culture with its chief vehicle of transmission was troublesome, particularly since it is language that is held responsible for the cumulativeness of culture. That is, Language makes possible not only that culture is transmitted, but also that culture increases as it is transmitted from generation to generation. This cummulativeness through language is the major mechanisms for cultural evolution.

The solution, while 'obvious' in light of the developments of cognitive anthropology (Ethoscience and New Ethnography are near synonyms) was nevertheless never clearly formulated.

Only one additional assumption needs to be made: the acquisition of language by a child has a natural history and in the course of this development language changes its function. At first the child learns its native language 'as a

member of society' and therefore following standard definitions of culture, *language is part of culture*.

However, there is more to it. Language acquisition specialists agree that language learning is completed by the age of four to six. Formal education, the institutionalized commencement of the acquisition of culture through language, begins after the child reaches full mastery of its native language. This happens universally at the age of five or six. The child has now completed learning those aspects of culture that do not require language and begins to learn the accumulated wisdom and technology of the social group in which it is growing up and that is coded in language. Through language the child learns the verbalisable aspects of his or her culture. The function of language has shifted, now *culture is in language*, or it is *acquired through language*.

3. Cognitive Anthropology and the Sapir-Whorf Hypothesis

The New Ethnography or Ethnoscience entered anthropology with two papers published in *Language* by Floyd Lounsbury (1956) and his student Ward Goodenough (1956). The topic was componential analysis of the Pawnee (which belongs to the Cadoan language family and was spoken in the southern Great Plains) and the Trukese (Austronesian speaking Micronesians) kinship systems.

The point of componential analysis, in the context of the Sapir-Whorf hypothesis, is that kinship terminology or the kinship lexicon of every language/culture combination views the same kinship space, but tends to subdivide it differently. The examples of kinship terminologies confirm the "linguistic relativity principle." Speakers of languages in different cultures experience the same "objective reality" but assign different terminology to it. The speakers of different languages lexicalize (set to words) the universal kinship space very differently.

For example, the Yankee kinship system used by English speaking North Americans merges all cousins (Most Americans no longer fully understand the terminology that classifies cousins by degree (first, second, ... cousin) based on the distance form a common ancestor (first cousin = two generations, i.e., shared grandparents, etc.) and by generational

distance (once, twice, ... removed).

For example, Tagalog[2], the main language of the Philippines, make no distinction between grand parents and grandparent's brothers and sisters. Crow and Omaha, both Siouxan languages spoken in the Great Plaines, merge some of the terms for cousins with certain aunts or uncles. Since the Crow recon descent through the maternal line (they are matrilineal) and the Omaha through the paternal line (they are patrilineal) the two systems are mirror images of each other. Navajo and Hungarian, an Ugro-Finnic language of central Europe, on the other hand, make a careful distinction between the relative age of brothers and sisters. The list of such culturally prescribed terminological differences is virtually endless.

Componential analysis was soon followed by the discovery of folk taxonomies. Various folk classifications were noted before (e.g., Maus 1923) but this was the first time that anthropologist / ethnographers collected folk taxonomies systematically. The seminal monograph was Conklin's *Hanuno'o Agriculture* (1954)(The Hanuno'o are Austronesian speaking people living on the island of Mindanao in the Philippines). A flurry of activity followed taxonomising everything from ethno-anatomies through fire wood to folk zoologies. Oswald Werner (1983) even presented the taxonomic aspects of the entire traditional Navajo universe.

In this lively debate the Sapir-Whorf hypothesis was mentioned only rarely and often outside of the context of the New Ethnography. The participants in this ferment tacitly assumed that componential analysis and folk taxonomies clearly demonstrate the weak lexical version of the hypothesis.

Out of these developments arose cognitive anthropology that took as its goal the investigation of human cognition, especially cultural knowledge.
It soon developed two branches. One is ethnoscience ethnography which tacitly assumes the validity of the weak lexical form of linguistic relativity but spends little energy on this link to the past. The more pressing task is seen as the perfection and systematization of ethnography.

The second branch moved closer to cognitive psychology and by that route to cognitive science. Berlin and Kay (e.g., 1969) soon emerged as the leaders in

2

this field with their work on color terminology. That different language/culture groups have different color terminologies was considered in the debates of the 1950's and early 1960's the prime example of the lexical version of the Sapir-Whorf hypothesis. Obviously, the color spectrum is a continuum of colors from red to purple, but human beings in different parts of the world partition this continuum differently.

Berlin and Kay's first important discovery was that the color spectrum is not a good example for the hypothesis. "[C]olor categorization is not random and the foci of basic color terms are similar in all languages" (Berlin & Kay 1969:10) and "...the eleven (see Figure 3.) basic color categories are pan-human perceptual universals" (Berlin & Kay 1969:109).

However, Berlin and Kay (1969:160 n2) are very careful in stressing that their work should not be confused with a thorough study of the ethnographic ramifications of color terminology. That is, "...to appreciate the full cultural significance of color words it is necessary to appreciate the full range of meanings, both referential and connotative..." or the lexical/semantic fields in which individual color terms are embedded.

Their second discovery was that color terminology evolves in a very lawful sequence. Although their formula has been "fine tuned" given new cross cultural data it can be represented as follows (their original formulation, 1969:4):

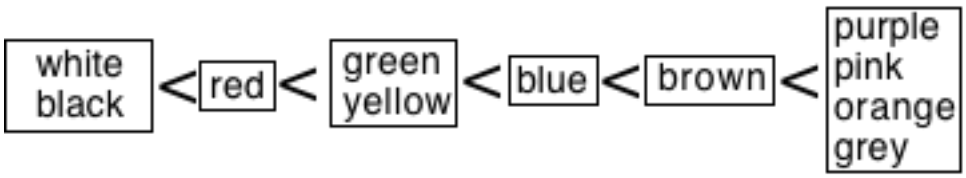

Figure 3.
The Cultural Evolution of Color Terminology
If a language has the term 'red,' then it also has 'black' and 'white;' if a language has the term 'green' and 'yellow', then it also has 'red,' 'white,' and 'black;' etc. The more technologically developed a given culture, the more of the 11 basic color terms are in use. (In the third box either order of green < yellow or yellow < green is possible).

Recently Lucy and Shweder (1988) have revived the controversy by showing in a few well designed experiments that color memory is highly sensitive to the lexical resources of a language and culture. They conclude that the universality of

color categories is overstated by Berlin and Kay and that the weak Sapir-Whorfian lexical formulation correspond more closely to the facts.

Willet Kempton extended the methodology of cognitive anthropology to the shapes of objects, thus exploring the boundary betwen categories. Cecil Brown took the evolutionary idea in Figure 3. and applied it to other aspects of human vocabularies, especially botanical and zoological terminologies.

Ethnographers soon expanded their view beyond componential analysis after it was shown by a number of anthropologists and linguists that components are also lexical items and hence most often language specific rather than universal. John Lyons' critique of componential analysis as a universal theory for cultural knowledge (and semantics) is devastating. Nevertheless, componential analysis remains a superb tool for understanding exotic kinship terminologies.

In 1970 Casagrande and Hale, who had collected a large numbers of folk definitions in Papago (a Uto-Aztecan language of southern Arizona along the United States—Mexican border). published 13 lexical/semantic relations. They failed to find examples of a postulated 14th, the part/whole relation, P/W. A close analysis of their data shows that the part whole relation did appear in its inverse form. That is, insted of 'A is a part of B' they found and classified as a spatial relation the inverse 'B has an A.').

Joseph Casagrande and Kenneth Hale's work was seminal for a number of researchers (Summarized in Evens et al. 1983). and linked their wok to the Cognitive Sciences, even though this link was never very strong.

The major insight of field theory can again be framed in terms of the linguistic relativity principle: The weak lexical version is accepted as self evident. The lexical/semantic fields of the languages used in different cultural contexts look very different. However, there is unity because the lexical/semantic fields are held together by **universal** lexical/semantic relations.

Unfortunately there is no agreement on the basic set of lexical/semantic relations which range from Werner's (Werner, Schoepfle, et al. 1987) two to the over 50 lexical relations of Apresian, Mel'chuk and Zholkovsky (1970). Werner's two relations are Taxonomy and Modification plus several derived complex realations, a

relation for sequential phenomena, and logical relations, including modal logic. Apresian et al.'s relations are derived from practical lexicography or the construction of more systematic dictionaries. For example their relation EQUIP is the relation in "ship" EQUIP "crew" ("A crew operates a ship") The folk taxonomic model can be applied to whole cultures. Closely related encyclopaedic works display the lexical and cultural knowledge dimensions of a culture. That is, a background document fully exploring the lexical resources of a language provides an important aspect of the culture as a whole.

Ethnography is seen by many scholars as translation *par excellence*. Ethnographic translation fundamentally encourages translators notes (definitions) that explain cultural ramifications of lexical items (or phrases) in native texts. Therefore, a carefully documented encyclopaedic lexicon may be seen as an extensive set of translator's notes prepared in advance of the analysis of any future ethnographic texts.

An extension of these ideas is the recent focus on cultural schemata (Casson 1983). Schemata, recast into the lexical version of the Sapir-Whorf hypothesis, are folk theories often labeled by words (especially verbs) or phrases that usually require complex (e.g., up to monograph length and beyond) explanations or folk definitions.

4. Summary and Conclusions

The choice of the symbol system (e.g., language) affects the ease or difficulty with which we can talk about particular domains of cultural reality and solve problems in them. Thus the lexicon of our language does provide a loosely laced straight jacket for our thinking because it provides us with customary categories of thought. Only in this sense does it constrains our thought.

At the same time language allows the inventive human mind to create alternative categorizations for the solution of new problems. The history of science and the rich diversity of thousand s of human languages and cultures attests to the inventiveness of the human spirit.

True, the combinatorial possibilities in human language are enormous. Thus the very use of language results in a drift of meanings and with it inadvertent

changes in world view. This process is analogous to genetic drift. But in addition there are analogues and historical examples of meaning mutations: conceptual revolutions and conversions.

However, these break-outs out of the mold of one's habitual language patterns is never easy—'... anomaly is recognized only with difficulty' (Kuhn 1962) It usually takes genius to show the rest of humanity how to see the world in a new light, that is in new categories. In such conversion experiences the language is affected to the core (Kuhn 1962) —Specifically, most grammatical categories remain usully the same but geniuses revamp lexical categories in ways that facilitate new thought that the rest of humanity can follow.

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