

Is Whorf's Relativity Einstein's Relativity?

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IS WHORF'S RELATIVITY EINSTEIN'S RELATIVITY ?

There is no central question more significant to the combined research efforts of psycholinguistics, linguistics, psychology, philosophy, anthropology, and even physics, than the language-and-cognition issue advocated by Benjamin Whorf and named the principle of linguistic relativity. Not simply for the past 30 years, but for almost 300 years of scientific debate and over 2000 years of Western intellectual speculation this issue of how different languages relate to ways of thinking has occupied some portion of the mental deliberations of hundreds of people in a professional way, as well as untold millions of (what we call) "linguistically naive people" coping with everyday multilingual situations. It is a problem of our time, and of all time.

Linguists, in general, do not spend much quality time in studying the history of ideas within our discipline, nor how those ideas affect other disciplines, primarily because we are preoccupied with current research. However, we are concerned here with the history of relativity, and especially whether Einstein's version, which revolutionized physics, had anything to do with either Humboldt's or Whorf's versions.

As I was preparing a manuscript entitled "Reality, Mind, and Language as Field, Wave, and Particle," the longer work on which this paper is in part based, I became particularly intrigued with Whorf's intellectual scope -- and, I might say, increasingly dismayed at his rather shoddy handling of bibliographic references, especially where he is paraphrasing a well-known author of his time. As I read works by physicists like Einstein, Heisenberg, and

Schroedinger, Gestalt psychologist Köhler, philosopher Cassirer, and linguist Humboldt, I kept getting distinct echoes of specific phrasings and statements by Whorf. After I pointed out a number of these recently to our Session Chair, Marilyn Silva, she suddenly quipped the line which is the central theme of this paper: "Whorf wasn't a weirdo -- he was just literate!"

Indeed, many of the (what are often considered) wild and somewhat suspect ideas of Whorf are often rephrasings of well-known statements made during his intellectual prime in the 1920s and '30s -- statements and ideas that are not so well known since the advent of what Dell Hymes (1961:26) called "an ideology hostile to questions of meaning".

If Whorf's critics today had any inkling of the background knowledge which Whorf took for granted -- the cream of Western intellectual thought in a time when all the major advances of modern physics were made -- they would know that Einstein provided special evidence for linguistic relativity, and that scientists don't waste their time empirically testing things called "principles".

What Is a Principle?[1]

The notion of principle, which is what Whorf called his statement of linguistic relativity, brings up a crucial point: "principle" is not interchangeable with either "theory" or "hypothesis". Within scientific nomenclature there is a progression from a conjecture to a hypothesis to a theory; then there are principles and their postulates. A principle is like an axiom in geometry, the unprovable scientific equivalent of a philosophical statement. As Cassirer points out (Itzkoff 1971),

Principles constitute fixed points of the compass that are required for successful orientation in the world of phenomena. They are not so much assertions about empirical facts as maxims by which we interpret these facts in order to bring them together into a complete and coherent whole.

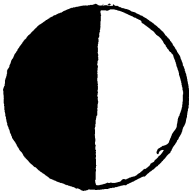
What I wish to suggest is that Whorf, in naming his formulation "a new principle of relativity" in honor of Einstein's then-recent formulations, "upped the ante," so to speak, on his future critics. That is to say, all psycholinguistic experimentation regarding Whorf's relativity has proceeded as if

Einstein never existed or provided a foundation of modern physics called relativity.

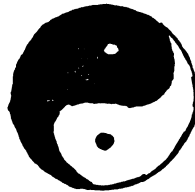
Whether Whorf was ultimately justified in self-promoting his statement to the status of principle is perhaps questionable. But more questionable by far are the actions of otherwise responsible social scientists who, seemingly assuming that they could judge Whorf's idea by ignoring its historical antecedents in German intellectual thought, relabeled the principle a theory or hypothesis, added a liberal shot of causal determinism, and then empirically tested the resulting hodge-podge and pronounced relativity invalid (at least in the strong or extreme form which includes determinism). Robinson (1975) points out that the modern universalists have never to his knowledge made any serious effort to refute relativity itself (such as the notion that languages structure concepts like time, space, and causation differently). Perhaps it is easier to deal with strawman issues than actually refute the content of relativity.

FIGURE 1

REDUCTIONIST
DICHOTOMY:
Yes/No Choice



HOLISTIC, COMPLEMENTARY
MUTUAL INTERDEPENDENCE:
Yes-Yes; both Yes and No



Complementarity

Before going more deeply into relativity, I'd like to introduce some of you to a totally new way of thinking, of putting opposite qualities into perspective. It's one of those relations between ideas that Humboldt, Sapir, Whorf, and modern physicists

have in common, but is significantly lacking during certain historical periods -- such as our recent past.

When I say "opposites" to you, you prototypically (for our culture) think of a popularly emphasized relation between them: one is yes, one is no; one is black, one is white. This illustrates our normal way of seeing opposites as contradictory. This binary or dichotomous thinking helps us to imagine that either/or are viable choices, which they almost never are. Whorf took for granted, as well, the kinds of opposites involved in the classic fundamental questions of early 20th century physics: is light matter? yes. is light energy? yes. This yes-yes thinking, which says that matter is a convenient way of saying what things are when they aren't being energy, is called complementarity, and is on the next level of thinking beyond considering opposites in a yes-no relationship. Complementarity straddles the subtle distinction of two things each being true in opposite but mutually interdependent ways, and before the 20th century was found perhaps most lucidly as the Tao of Eastern mysticism -- the golden road of balance.

FIGURE 2

EXAMPLES OF COMPLEMENTARY ("YES-YES") THINKING

- | | | | |
|----|----------------------------------------------------------------------------------------------------------------------------|-----|--------------|
| 1. | Is light matter (particle)? | yes | ("wavicles") |
| | Is light energy (waves)? | yes | |
| 2. | Are opposites contradictory? | yes | |
| | Are opposites complementary? | yes | |
| 3. | Are human beings matter? | yes | |
| | Are human beings energy? | yes | |
| 4. | Does language project habitual illusory restrictions on our understandings of reality? (relativity) | | yes |
| | Does language depend on biological, social, and other organizations and functions common to all human beings? (universals) | | yes |
| 5. | Is language particle-like? | yes | |
| | Is language wave-like? | yes | |
| | Is language field-like? | yes | |
| 6. | Does language mold thinking? | yes | |
| | Does thinking mold language? | yes | |
| 7. | Are there significant differences in language? | yes | |
| | Are there significant similarities in language? | yes | |

Figure 2 gives some examples of yes-yes thinking which can be helpful for considering our present topic: such as #4, which affirms that BOTH relativity and universals are opposite but equally true and useful ways of orienting oneself to the facts of language; the same is true for #7. These examples illustrate a way of thinking, be it called organic, gestaltic, holistic, or any other of more than 30 terms found in the literature, which Humboldt, Sapir, and Whorf took for granted. This is noteworthy because the complementary way of viewing oppositions, common in earlier generations, often seems too subtly complex for us to comprehend.

Roger Brown, for instance, in a book examining Humboldt's conception of linguistic relativity, quotes a statement by Humboldt regarding the mutual interdependence between thought and language -- and yet, when faced with, to him, the "logically inconsistent" fact that Humboldt advocated both relativity and universals, could conclude only that Humboldt was being inconsistent; Brown and others have similarly used this inconsistency argument against Whorf.

It is curious how the insights of an older generation can be lost so quickly in the rush for technological progress; how, unerringly throughout history, the holistically balanced insights of one generation become, in the next, plundered merely for their analytic regularities. This is how Chomsky, for instance, could claim Humboldt as an "honorable ancestor" while dismissing his non-analytic insights as "romantic". To wit: it seems that hard-won intellectual gains of the early 20th century have been forgotten by post-Hiroshima intellectuals. Hopefully, the relearning of early 20th century insights will separate the late 20th century from the mid. Universalists have nothing to fear from relativists; since languages have both differences and similarities, each position can illuminate the efforts of the other as long as neither claims superiority.

Humboldt, Sapir, and Whorf have gotten bad press in their times for being "contradictory" when viewed from an analytically logical point of view, primarily because they advocated in different writings either relativity or universals; the yes-yes statements got translated into yes/no interpretations which destroyed the holistic or gestalt insights originally expressed.

FIGURE 3

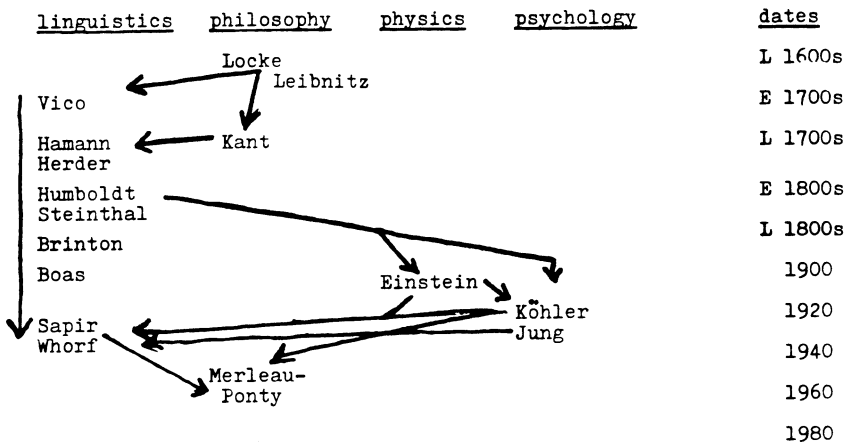
HISTORY OF AN IDEA: RELATIVITYPartial History of An Idea: Relativity

Figure 3 shows a partial history of the idea of relativity, which, from its beginnings in ancient Greece, was always concerned with the relation between thinking and languages. What started out as a question of philosophy in the time of Leibnitz and Locke -- or, more precisely, a question of philosophy of language -- took on added significance when data-oriented linguists began taking it seriously with the rise of comparative grammar. Whether one sides with the universalist or the relativist position has a lot to do with whether one looks for and describes a language in terms of universal categories, or whether one describes the language in its own terms, according to its unique inner form or particular historical and environmental worldview.

Relativity predated Humboldt[2], but for now, let's hit the highlights of this story from Humboldt on. Of most importance here is the complementary attitude which allows him to champion both universals and relativity in the same breath:

Thinking is not merely dependent on language in general, but, up to a certain degree on each specific language (Cowan 1963).

In shorthand, A is not merely dependent on B, but also on B1 or B2, etc. Humboldt's balanced insight is interpreted by Brown to mean that B1 or B2 causally determine A, that "the forms of language determine the forms of thought." Like "principle" and "hypothesis", "depend on" and "determine" are considered interchangeable terms!

Humboldt writes elsewhere (Cowan 1963), "Every language sets certain limits to the spirit of those who speak it; it assumes a certain direction and, by doing so, excludes many others." This is a crucial statement since Brown calls this the basis for a strong argument for linguistic relativity, even though it says nothing about causal determinism. It simply says that every language makes choices about what is culturally important; once made and settled into the habitual grammatical or lexical patterns of a people, it assumes that people will usually follow the socially accepted way instead of countless possible others. Native Americans are often puzzled at our cultural notions of "weeds" and "vermin", which single out flora and fauna considered worthless -- a distinction which was foreign to their cultural valuing of each part, piece, and scrap for survival.

The rich and enigmatic ideas of Humboldt have influenced all of Western thought, especially through the university system of education which he established. It takes no leap of imagination to realize that men with names like Einstein, Boas, Sapir, Kohler, Jung, and Von Neumann were the cultural recipients of early schooling in German intellectual thought; we have an unbroken historical lineage. Relativity has the same basic meaning for all these scholars, as we see when we turn to Einstein, for instance.

All of this century's major statements regarding linguistic relativity followed Einstein's formulations in physics -- a fact which too few critics have explored for its implications. Gary Zukav (1979:280), in a recent history of physics, explains that John Von Neumann's "discovery that our thought processes (the realm of symbols) project illusory restrictions onto the real world is essentially the same discovery that led Einstein to the general theory of relativity." He explains (p160):

The general theory of relativity shows us that our minds follow different rules than the real world does. A rational mind, based on the impressions that it receives from its limited perspective, forms structures which thereafter determine what it further will and will not accept freely. From that point on, regardless of how the real world actually operates, this rational mind, following its self-imposed rules, tries to superimpose on the real world its own version of what must be.

This continues until at long last a beginner's mind cries out, "This is not right. What 'must be' is not happening. I have tried and tried to discover why this is so. I have stretched my imagination to the limit to preserve my belief in what 'must be.' The breaking point has come. Now I have no choice but to admit that the 'must' I have believed in does not come from the real world, but from my own head."

This narrative is not poetic hyperbole. It is a concise description of the major conclusion of the general theory of relativity and the means by which it was reached. The limited perspective is the perspective of our three-dimensional rationality and its view of one small part of the universe (the part into which we were born). The things that "must be" are the ideas of geometry (the rules governing straight lines, circles, triangles, etc.). The beginner's mind was Albert Einstein's. The long-held belief was that these rules govern, without exception, the entirety of the universe. What Einstein's beginner's mind realized was that this is so only in our minds.

Remembering that Whorf (1956:208) calls mathematics a specialized extension of language, we are led to a common conceptual denominator linking the relativity formulations of Einstein, Sapir, and Whorf. Einstein's special problem revolved around the privileged status which Euclidean geometry held for organizing the world through its projections; for Humboldt, Sapir, Boas, Whorf and others, the problem was the privileged status held by Western Reason and the traditional categories of Indo-European grammar being projected onto exotic

languages. As Humboldt stressed the way each language sets limits, so Einstein wrote that the great power possessed by the general principle of relativity lay in the comprehensive limitation imposed on the laws of nature.

It cannot have escaped Einstein's notice that his discovery that one geometry could be as valid as another for mapping nature was a specialized case of the historical language-and-thinking problem, for he dealt with linguistic relativity in a little-known 1941 radio speech:

What is it that brings about such an ultimate connection between language and thinking? ...the mental development of the individual and his way of forming concepts depend to a high degree upon language. This makes us realize to what extent the same language means the same mentality.

So relativity, a philosophical language-and-thought question for thousands of years, was specialized by Einstein as a geometry-and-thought question for the philosophy of mathematics; thereafter the dual Humboldtian-Einsteinian strains of relativity led to formulations by Sapir and Whorf, the latter copying Einstein's use of the word "principle".

There are two ways of firming up the Einstein-Whorf connection even further. One is to mention that certain heretofore unknown manuscripts by Benjamin Whorf (Rollins 1980)[3] show clearly Whorf's expertise in physics: he wrote three articles on the topic of concrete models of gravitation in which he prophetically established a fundamental unity between gravity, light and matter, anticipating by decades the formulation of "matter is gravitationally trapped light" by Jack Sarfatti as his interpretation of $E=mc^2$.

The other way is to show the similarity of concepts and phraseology between Einstein and Whorf; compare the following statements:

1A(lbert): Science has taken over from pre-scientific thought the concepts space, time, and material object..., and has modified them and rendered them more precise.

1B(enjamin): language does in a cruder but also in a broader and more versatile way the same

thing that science does (see also 3B).

- 2A: We are thus led to extend the transformations to arbitrary continuous transformations. This implies the general principle of relativity: Natural laws must be covariant with respect to arbitrary continuous transformations of coordinates.
- 2B: We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.
- 3B: From this fact proceeds what I have called the "linguistic relativity principle," which means, in informal terms, that users of markedly different grammars [cf. geometries] are pointed by their grammars [geometries] toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers, but must arrive at somewhat different views of the world....From each such unformulated and naive world view, an explicit scientific world view may arise by a higher specialization of the same basic grammatical patterns that fathered the naive and implicit one. Thus the world view of modern science arises by higher specialization of the basic grammar of the Western Indo-European languages.

Thinking and Meaning

As we have seen, Humboldt, Einstein, and Whorf were all deeply concerned with the question of thinking -- the very question which phenomenologist Merleau-Ponty (1964:17) cites as the basic question all philosophy starts with. Whorf (1956:78) states that linguistics is fundamental to the theory of thinking and in the last analysis to ALL HUMAN SCIENCES. Perhaps it is simply because these men did not refer to themselves as philosophers of language that we also do not.

FIGURE 4

LINGUISTIC RELATIVITY SCORECARD		
HISTORICAL	CAUSAL	
Mutual Interdependence	"Weak"	"Strong"
Humboldt Sapir Whorf Others	Sapir-Whorf Critics	Nobody "hypothesis" testing pronouncements: "strong form is invalid"

As philosophers of language, their main fascination lay with the astoundingly diverse but patterned differences which make up the phenomenal world around us, and the way symbols project habitual illusory restrictions onto the "out there". We all know there is something "out there" on which our perceptions of the world depend; we know that language certainly can't be projecting it all. But it does project artificial distinctions and discriminations, differently patterned for each language, which organize the world in a comfortable and workable way. "The world doesn't yield to us directly," as don Juan tells Carlos Castaneda, "the description of the world stands inbetween." And elsewhere, "When you stop your words, you stop your world." [4]

The problem is how to distinguish the out-there from our word-built reconstruction of it, to discover the absolute limits of language. Language becomes a hindrance for viewing reality. Mystics and physicists tell us equivalent tales of their experiences with those limits -- mystics when they describe the insights of altered states of consciousness, and physicists when they describe atoms and subatomic particles. To the Zen master (Talbot 1981), "existence" and "nonexistence" impart no useful information. Likewise, when physicists tell us that an atom consists entirely of its radiations and that there is no "thing" there radiating, or when

they tell us that one electron is indistinguishable from another, that the words "same" and "different" give us no real information about electrons, they demonstrate that they, no less than linguists, are concerned with the limits of language. That is, when they find that two mutually exclusive words like "same" and "different" become interchangeable, neither imparts any real information. The ultimate nature of reality transcends language. As Heisenberg wrote,

The problems of language here are really serious. We wish to speak in some way about the structure of atoms...But we cannot speak of atoms in ordinary language.

That is because language is based upon discrimination: discrimination is meaning. If one cannot discriminate between two electrons, there is no meaning in words ascribed to their differences. Our minds flip-flop our word gestalts and create the illusion that words possess meaning. The words on this page possess no meaning. There is no meaning in words; only discrimination, which has to do with conventional ways of thinking in a language. If we allow this notion of discrimination a certain similarity to Whorf's (1956:67-8) "rapport",

It is not words mumbled, but RAPPORT between words, which enables them to work together at all to any semantic result. It is this rapport that constitutes the real essence of thought insofar as it is linguistic...

Conclusion

In exposing the Humboldt-Einstein-Whorf connection within the total history of the idea of relativity, we are presented with an intriguing strategy for the future. First, by accepting that there are valid domains for both relativity and universals, we can save a lot of time and money trying to disprove this view or that, we can accept the complementary as well as the contradictory relation between opposites the way other disciplines do (and ours in past times did), and go on with our business. Secondly, if anyone questions our use of Whorf we can now simply refer them to Einstein and say that his established special case validates the Humboldt-Boas-Sapir-Whorf general case.

In sum, those critics who attempt to make or retain their reputations by attacking the so-called "(Sapir-) Whorf Hypothesis" must henceforth be seen as attacking, as well, the physics principle and theory (not "hypothesis") which Whorf merely restated for linguistics: Einstein's General Theory of Relativity.

* * * * *

NOTES

- [1] See Alford 1981 for further discussion.
- [2] For a fuller treatment of pre-Humboldtian treatments of relativity, see Steiner (1975), Brown (1967), Alford (1980) and Alford (1981). Also see Huncl'd 1981 in this volume for more on Humboldt.
- [3] See Alford 1981b for a fuller review of this book.
- [4] Both of these statements echo Humboldt, with his notion that language is a transparent envelope through which we communicate, and that the limits of our language are the limits of our world.

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