Benjamin Lee Whorf (1897-1941) was an American linguist best known for the development and exemplification of a principle of linguistic relativity.

**Life**

Whorf came from a New England family with both artistic and scientific interests. He trained in chemical engineering, graduating from Massachusetts Institute of Technology in 1918, and soon after was hired as a fire prevention engineer at Hartford Fire Insurance, a position he held for the rest of his life, with time off for research. Whorf had theosophical connections, and he remained interested in spiritual questions and the relation of science to religion. But from an early age, his central fascination was in languages and their basic elements. In the 1920s, he started working on Aztec (Nahuatl) and Mayan languages, presenting scholarly papers and coming into contact with major figures in the field. In 1930, he obtained funding for research in Mexico, including fieldwork on Nahuatl as spoken in a village outside Mexico City. Whorf’s work on Mexican material led, among other things, to a prescient proposal for the interpretation of the Mayan script as involving an important phonetic element. This view, dismissed for decades, turns out to have been essentially correct.

Whorf’s thinking was transformed through contact with Edward Sapir, who moved to Yale in 1931. Whorf attended Sapir’s classes and joined the PhD program under his supervision. Sapir urged Whorf to undertake the long-term study of a language very different from those of the Indo-European and Semitic families. Already familiar with Nahuatl, Whorf began years of work with Ernest Naquayouma, a New York-based native speaker of Hopi, another Uto-Aztecan language. Over the next 10 years, Whorf was an active participant in what has come to be called the first Yale school of linguistics. He was recognized by Sapir as “one of the most valuable American Indian linguists that we have at the present time” and taught one of Sapir’s courses in 1938. In the summer of that year, Whorf visited the Hopi reservation in Arizona. Whorf died in 1941, at the age of 44.

**Theory**

From the time of his “conversion” via Sapir, Whorf was an exponent of Boasian linguistics, which denies assumptions of the superiority of some languages over others and of the universality of Western grammatical categories. Boasians showed that “primitivity” lay in the ear of the listener, since any language can seem chaotic and bizarre, and either excessively vague or excessively narrow in focus—both are used as criteria of “primitivity”—if judged by the standards of another. For this reason, holders of the Boasian view argued that it was inappropriate to start from the categories of traditional Western grammar, assume that they were universal, and then seek to find how they were expressed in non-Western languages. Instead, one should interrogate the forms themselves as they are used, something that will often require new terminology that more adequately reflects the actual patterns of the language. Basic elements of this linguistic program, as Boas himself recognized, had been laid out by Wilhelm von Humboldt (1769-1835) early in the 19th century. Much of Whorf’s work was a drawing out of its implications.

Whorf himself, with his background in the natural sciences, seems to have assumed three operational “levels” in his thinking about science and linguistics.
Level 1: This level is that of the actual physical structure of the universe. Through most of modern
Western history, this appeared to be adequately represented by Euclidean geometry and Newtonian
physics. But developments in 20th-century science—Whorf cites relativity theory, quantum mechanics,
and non-Euclidean geometry—reveal a very different universe, one that does not correspond directly
either to our lived experience of the world or to our conceptualization of it. In this, Whorf was a
scientific discontinuist very much like his older contemporary Gaston Bachelard (1884-1961), and like him
was interested both in critiquing and in understanding “common sense.”

Level 2: Whorf accepted that there were universals of human experience, potentially offering “a canon
of reference for all observers,” beyond the diversity of languages and cultures. He saw Gestalt
psychology as a science likely to uncover such a general frame.

Level 3: While lived experience may be universal, conceptualizations of this experience depend to a
large degree on language and culture, and so vary. Although Whorf never claimed that all thinking is
linguistic, he did maintain that we think to some degree in language and that insofar as this is the case,
the traits of given languages can orient the subject to attend to differing aspects of experience. This
point had been made by Boas and formulated by Sapir, citing Einstein, as “a kind of relativity”; Whorf
wrote of “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” (Whorf, 2012, p. 214). The references to Einstein make it clear that this is a
heuristic principle: Just as the observer must take his or her position and velocity into account when
measuring someone else’s, so the observer must take the patterning of his or her own language into
account when considering another one. Just as there is no unmoving point in the Einsteinian universe,
so for the Boasians, there is no language or group of languages that provides the measure for all
others. Measurement, or calibration, is possible, but it can only be mutual, taking the specifics of both
participants into account.

Boas and Sapir had insisted that one’s language posed no limit to the potentialities of what one could
conceive, yet both gave examples in which language did influence conceptualization. Whorf resolved
this apparent contradiction by introducing a distinction between the (unlimited) possibilities of thought
and the limits of what he called habitual thought—unforced everyday thinking that tends to follow the
easiest associative pathways, those laid down by languages and cultures. The idea that habituation
creates easy, but not inescapable, paths to follow is clear in the very analogies used by Whorf (and
earlier by Sapir) to characterize the influence of linguistic patterns: tracks, paths, roads, grooves—it is
always possible, with effort, to get off the beaten track and lay down a new one. This is an important
point in reading some of Whorf’s apparently deterministic statements, which are always referring to
habitual thinking; and it is why there is no contradiction in Whorf himself feeling that it should be
possible, for instance, to use English to give a presentation of concepts implicit in Hopi grammar.

The relativity principle operates for all levels of language. Phonetics and phonemics provide a model
(“Phonemics is a relativity principle” [cited in Lee, 1996, p. 88])—it was Whorf who introduced the term
allophone to indicate a positional variant of a phoneme. Vocabulary is pertinent insofar as words are
related or unrelated, thus showing a conceptual linkage between referents. But the aspect of language
on which Whorf concentrated most of his attention was that of pervasive grammatical categories.
These categories, such as gender, tense, number, or, in some non-Western languages, shape or data
source, are constantly used in constructing sentences and are not easily accessible to conscious
reflection. As a result, as Boas had indicated, they are likely to guide attention to some aspects of a
situation rather than others, and to do so unconsciously or semiconsciously. These categories could be explicitly marked (overt) or not (covert); Whorf was a pioneer in the identification of covert categories or cryptotypes.

**Hopi and Standard Average European**

Whorf offered an extended reflection on the conceptual implications of grammar in a series of articles on Hopi. His approach is always through contrast, as exposure to a very different system makes our own assumptions explicit. Whorf introduces the idea that in important ways modern western European languages share underlying grammatical semantics: Instead, then, of talking only about English, Whorf contrasts Hopi with what he calls Standard Average European (SAE), a category that has come to be recognized as a distinctive linguistic area, or Sprachbund.

- In SAE, plurality applies both to real plurals, items that can appear together, and “imaginary plurals,” items that can never appear together to form a group. So English treats “ten men” and “ten days” in the same way. Hopi, on the other hand, only has real plurals. This has a first implication for concepts of time: The universal human experience of duration (Level 2 above) is conceptualized differently in the two cases. In SAE, units of time are treated as things that can be counted using cardinal numbers; in Hopi, time relations are treated with ordinals: “on the tenth day” rather than “ten days.”

- SAE languages have both count and mass nouns (“three bottles” vs. “some water” or “a glass of water”). This distinction, Whorf argues, leads to conceiving imaginary masses of substance, notionally infinite extents of water, or bread, or bone, out of which “a glass of water,” “a loaf of bread,” or “a bone,” respectively, are notionally cut. This extends to time, which is treated as a limitless uniform substance of which years, days, and minutes are chunks of differing size. Hopi, on the contrary, only has count nouns. “In specific statements, ‘water’ means one certain mass or quantity of water, not what we call ‘the substance water.’” And time, which in human experience never takes the form of a thing with a shape, is not treated with nouns at all in Hopi but with “a kind of adverb, to use the nearest SAE analogy.”

- One class of Hopi verbs can appear either using the unmarked stem, which gives the meaning of a single occurrence, or in a form indicating repeating action. Unlike SAE verbs, however, this distinction operates equally over what we call time and what we call space: Just as the punctual verb “It gives one slosh” has a segmentative form “It is tossing in waves,” the punctual “It forms a sharp acute angle” has the segmentative “It is zigzag.”

- A Hopi verb can either be unmarked or carry one of two suffixes that indicate distinctions that most of the literature (including Whorf’s earlier formulations) labels as tenses but that Whorf—on second reading, as it were—came to conceive of as “validity forms,” which he called “assertions”: the unmarked reportive, formerly called past-present; the expectative, formerly called future; and a third form that indicates general truths. Whorf argues that the first two are not tenses in the SAE sense but distinctions between what is already known, including both the past and the objective aspect of the present, and what is coming into being, including both what we call the future and the transformative aspects of the present. SAE, by contrast, has a three-part division of past, present, and future, which, in accord with the treatment of mass substance discussed above, are conceptualized as virtual “spaces” to be filled with events. This corresponds to the modern Western conceptualization of “time” (Level 3), but it is only one of many possible
constructions accounting for the general human experience of time as duration (Level 2)—the Hopi “assertions” offer another.

- Whorf thus claims that Hopi conceptualizes (Level 3) human spatiotemporal experience (Level 2) differently than does SAE. In particular, it does not separate empty uniform space from a domain of uniformly flowing one-dimensional time. This is why, in an often cited manuscript passage, Whorf (2012) writes that Hopi contains

  no words, grammatical forms, constructions or expressions that refer directly to what we call “time,” ... or that even refer to space in such a way as to exclude that element of extension or existence that we call “time,” and so by implication leave a residue that could be referred to as “time.” (pp. 73-74)

- This has often been taken to mean that the Hopi are either primitives incapable of conceiving time or mystics living outside time: On the contrary, what Whorf is saying is that our own constructions of space and time (Level 3) are “recepts from culture and language.”

**Whorf After Whorf**

At the time of Whorf’s death, he had published only a small number of articles. During the following 15 years, these were reprinted along with manuscripts discovered after his death, culminating in 1956 in the publication of the volume *Language, Thought, and Reality: Selected Essays of Benjamin Lee Whorf*, which is still the main source for Whorf’s writings.

In the 1950s, researchers interested in testing for linguistic variation in cognition first mentioned a “Whorfian hypothesis” or “Sapir-Whorf hypothesis” that language influences thinking in a way that should be amenable to the kind of testing psychologists are comfortable with. Note the difference between such a “hypothesis” and Whorf’s principle of linguistic relativity requiring the specific characteristics of one’s language to be taken into account. The psychologists carried out testing primarily on vocabulary, not on grammatical categories, and the favorite domain was that of color. It was argued that since Whorf believed that language, which could be reduced to vocabulary, determined thinking, and therefore perception, he must have held that the number of color words should determine color perception. Since, in fact, human physiology affects color perception, such experiments generally failed to show significant language-based differences.

With the rise of the cognitive sciences from the 1960s, with their project of discovering how thinking works regardless of linguistic and cultural differences, Whorf became a convenient straw man: Philosophers, psychologists, and linguists regularly took his name as a label for extreme linguistic determinism (“the famous Sapir-Whorf hypothesis of linguistic determinism,” as Steven Pinker puts it), which they then proceeded to disprove or dismiss, over and over again. One particularly influential critique came in 1981 from the linguist Ekkehart Malotki, who argued that many Hopi forms can best be translated into English using tenses and the whole SAE “metaphysics” of time. The method here is the opposite of Whorf’s (and of Boas’s and Sapir’s): It asserts universal (which happen to correspond to SAE) meanings for forms and then notes exceptions, leaving them as exceptions. In this, it confuses what I have called Level 2 and Level 3, taking SAE conceptualizations as equivalent to human experience in general.

Although some scholars had continued to draw on Whorf’s ideas throughout the period (e.g., Dell
Hymes, Paul Friedrich, Michael Silverstein, and George Lakoff), the 1990s saw a snowballing of interest. This was due both to more serious exegeses of what Whorf actually said in the work of John Lucy and Penny Lee and to more sophisticated psychological testing, often based on grammatical categories (e.g., number, animacy, space and time categories, gender), which began to find “Whorf effects.” There is even talk of a “neo-Whorfian renaissance.” So far, this rediscovery bears mainly on cognition. But the principle of linguistic relativity as Whorf formulated it is open-ended: We do not know the implications that using a given language may have not only for cognition but also for broader conceptualization and imagining, for everyday social interaction, or for the exploitation of linguistic potentialities in verbal art.

See also Boas, Franz; Carneiro, Robert L.; Kroeber, Alfred L.; Lowie, Robert; Murdock, George Peter; Parsons, Elsie C.; Sahlins, Marshall; Service, Elman R.; Steward, Julian; University of Michigan

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