

12. The Relation of Habitual Thought and Behavior to Language

Benjamin L. Whorf (1897–1941)

Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the "real world" is to a large extent unconsciously built up on the language habits of the group . . . We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation.

—EDWARD SAPIR¹

THERE WILL PROBABLY be general assent to the proposition that an accepted pattern of using words is often prior to certain lines of thinking and forms of behavior, but he who assents often sees in such a statement nothing more than a platitudinous recognition of the hypnotic power of philosophical and learned terminology on the one hand or of catchwords, slogans, and rallying cries on the other. To see only thus far is to miss the point of one of the important interconnections which Sapir saw between language, culture, and psychology, and succinctly expressed in

the introductory quotation. It is not so much in these special uses of language as in its constant ways of arranging data and its most ordinary everyday analysis of phenomena that we need to recognize the influence it has on other activities, cultural and personal.²

THE NAME OF THE SITUATION AS AFFECTING BEHAVIOR

I came in touch with an aspect of this problem before I had studied under Dr. Sapir, and in a

From *Language, Culture, and Personality* (1941)

1. Whorf opens this essay with a quote from his friend and mentor, Edward Sapir (1884–1939) that is a strong statement of linguistic relativity and determinism, the principles underlying the Sapir-Whorf hypothesis. This essay, written in 1939, was first published in *Language, Culture, and Personality*, a 1941 memorial volume dedicated to Sapir, who died in 1939. The fundamental point of the essay is to demonstrate some ways in which grammatical categories in language unconsciously influence the ways in which people interpret the world around them and thus direct their behavior (*linguistic determinism*). Whorf argues that speakers of different languages think and act differently because their languages create different conceptual worlds (linguistic relativity).

2. Whorf begins by noting that there "will probably be general assent" to the notion that language precedes thought. This is, in fact, a very controversial proposition (see Pinker 1994). To some degree, by claiming "general assent," Whorf assumes what he is trying to prove, that language asserts a controlling influence on thought and action.

field usually c
tics. It was in
work for a fire
undertook the
of reports of c
start of fires, a
My analysis wa
cal conditions,
ence or lack of
and woodwork,
sented in the
taken with no
cances would o
course it becam
cal situation q
that situation t
tor, through the
start of the fire.
clearest when i
siding in the na
commonly app
around a storag
drums," behavi
that is, great c
around a storage
oline drums," i
careless, with lit
tossing cigarette
drums are perh
they contain ex
uation is hazard
according to re

3. Whorf is an
never held a reg
1930s, he was ed
Company. Whorf
jobs were difficu
that allowed him

Whorf became
investigating the
insurance inspect
adequately descri
the "spun limest
because it influen

4. Some of Wh
actually driven by
"spun limestone"
who bought the r
know the name of
were caused by li

field usually considered remote from linguistics. It was in the course of my professional work for a fire insurance company, in which I undertook the task of analyzing many hundreds of reports of circumstances surrounding the start of fires, and in some cases, of explosions. My analysis was directed toward purely physical conditions, such as defective wiring, presence or lack of air spaces between metal flues and woodwork, etc., and the results were presented in these terms. Indeed it was undertaken with no thought that any other significances would or could be revealed. But in due course it became evident that not only a physical situation *qua* physics, but the meaning of that situation to people, was sometimes a factor, through the behavior of the people, in the start of the fire. And this factor of meaning was clearest when it was a *linguistic meaning*, residing in the name or the linguistic description commonly applied to the situation. Thus, around a storage of what are called "gasoline drums," behavior will tend to a certain type, that is, great care will be exercised; while around a storage of what are called "empty gasoline drums," it will tend to be different—careless, with little repression of smoking or of tossing cigarette stubs about. Yet the "empty" drums are perhaps the more dangerous, since they contain explosive vapor. Physically the situation is hazardous, but the linguistic analysis according to regular analogy must employ the

word "empty," which inevitably suggests lack of hazard. The word "empty" is used in two linguistic patterns: (1) as a virtual synonym for "null and void, negative, inert," (2) applied in analysis of physical situations without regard to, e.g., vapor, liquid vestiges, or stray rubbish, in the container. The situation is named in one pattern (2) and the name is then "acted out" or "lived up to" in another (1), this being a general formula for the linguistic conditioning of behavior into hazardous forms.³

In a wood distillation plant the metal stills were insulated with a composition prepared from limestone and called at the plant "spun limestone." No attempt was made to protect this covering from excessive heat or the contact of flame. After a period of use, the fire below one of the stills spread to the "limestone," which to everyone's great surprise burned vigorously. Exposure to acetic acid fumes from the stills had converted part of the limestone (calcium carbonate) to calcium acetate. This when heated in a fire decomposes, forming inflammable acetone. Behavior that tolerated fire close to the covering was induced by use of the name "limestone," which because it ends in "-stone" implies noncombustibility.⁴

A huge iron kettle of boiling varnish was observed to be overheated, nearing the temperature at which it would ignite. The operator moved it off the fire and ran it on its wheels to

3. Whorf is an unusual figure in the history of anthropology in that he is a widely known theorist who never held a regular academic position. Although he was an honorary research fellow at Yale in the mid-1930s, he was educated as a chemical engineer and he spent his career working for the Hartford Fire Insurance Company. Whorf began his studies with Sapir in 1931 during the Great Depression, at a time when academic jobs were difficult to find and did not pay well. Whorf considered himself lucky to have had a lucrative job that allowed him time to pursue his intellectual interests.

Whorf became aware of the effect of language on thought, as he says at the start of this section, while investigating the causes of fires. In this section Whorf provides a series of examples from his work as an insurance inspector. He claims that in these cases, fires started because the language people used did not adequately describe physical reality. He proposes that the "empty" gasoline drums were not really empty and the "spun limestone" was not stone. The implication is that the language we use can affect our actions because it influences the way we think about things.

4. Some of Whorf's examples are troubling. We really don't know how much of the workers' behavior was actually driven by the use of language and how much of it was Whorf's interpretation. For example, was the "spun limestone" allowed to catch fire because workers thought of it as stone, or did they and the owners who bought the metal stills simply assume that the manufacturer provided safe equipment? Did the workers know the name of the insulation at all? As you read the examples that follow, consider whether the problems were caused by linguistic confusion or simply lack of attention or knowledge.

a distance, but did not cover it. In a minute or so the varnish ignited. Here the linguistic influence is more complex; it is due to the metaphorical objectifying (of which more later) of "cause" as contact or the spatial juxtaposition of "things"—to analyzing the situation as "on" versus "off" the fire. In reality, the stage when the external fire was the main factor had passed; the overheating was now an internal process of convection in the varnish from the intensely heated kettle, and still continued when "off" the fire.

An electric glow heater on the wall was little used, and for one workman had the meaning of a convenient coat hanger. At night a watchman entered and snapped a switch, which action he verbalized as "turning on the light." No light appeared, and this result he verbalized as "light is burned out." He could not see the glow of the heater because of the old coat hung on it. Soon the heater ignited the coat, which set fire to the building.

A tannery discharged waste water containing animal matter into an outdoor settling basin partly roofed with wood and partly open. This situation is one that ordinarily would be verbalized as "pool of water." A workman had occasion to light a blowtorch near by, and threw his match into the water. But the decomposing waste matter was evolving gas under the wood cover, so that the setup was the reverse of "watery." An instant flare of flame ignited the woodwork, and the fire quickly spread into the adjoining building.

A drying room for hides was arranged with a blower at one end to make a current of air along the room and thence outdoors through a vent at the other end. Fire started at a hot bearing on the blower, which blew the flames directly into the hides and fanned them along the room, destroying the entire stock. This hazardous setup followed naturally from the term "blower" with its linguistic equivalence to "that which blows," implying that its function necessarily is to "blow." Also its function is verbalized as "blowing air for drying," overlooking that it can blow other things, e.g., flames and sparks. In reality, a blower simply makes a current of air and can exhaust as well as blow. It should have been installed at the vent end to *draw* the air over the hides, then

through the hazard (its own casing and bearings), and thence outdoors. Beside a coal-fired melting pot for lead reclaiming was dumped a pile of "scrap lead"—a misleading verbalization, for it consisted of the lead sheets of old radio condensers, which still had paraffin paper between them. Soon the paraffin blazed up and fired the roof, half of which was burned off.

Such examples, which could be greatly multiplied, will suffice to show how the cue to a certain line of behavior is often given by the analogies of the linguistic formula in which the situation is spoken of, and by which to some degree it is analyzed, classified, and allotted its place in that world which is "to a large extent unconsciously built up on the language habits of the group." And we always assume that the linguistic analysis made by our group reflects reality better than it does.

GRAMMATICAL PATTERNS AS INTERPRETATIONS OF EXPERIENCE

The linguistic material in the above examples is limited to single words, phrases, and patterns of limited range. One cannot study the behavioral compulsiveness of such material without suspecting a much more far-reaching compulsion from large-scale patterning of grammatical categories, such as plurality, gender and similar classifications (animate, inanimate, etc.), tenses, voices, and other verb forms, classifications of the type of "parts of speech," and the matter of whether a given experience is denoted by a unit morpheme, an inflected word, or a syntactical combination. A category such as number (singular vs. plural) is an attempted interpretation of a whole large order of experience, virtually of the world or of nature; it attempts to say how experience is to be segmented, what experience is to be called "one" and what "several." But the difficulty of appraising such a far-reaching influence is great because of its background character, because of the difficulty of standing aside from our own language, which is a habit and a cultural *non*

est disputant tively. And i guage, this la and we even d to nature. We guage in order Or we find th morphologica seems to abs though difficu proach is throu study we are at of our ruts. Th guage is a mirr

In my study now see as an o lem was first t clearly aware o endless task of finally end. Yet i light of Sapir's le scription of the plete. I knew fo formation of plu rals. It was evide in Hopi was not French, or Germ plural in these Hopi. The phase began consumed work began to ass

5. *Non est disputant*.
"There is no account"

6. Whorf is suggesting that people perceive the nature of the world differently because of the nature of the words we must ultimately use, despite our tendency to see the world as a problem. Additionally

7. European scholars have been concerned with evolutionary thinking; the ranking of cultures that different language concepts of time, space, and that these differences. Note that Whorf has among these language singular in English but

est disputandum,⁵ and scrutinizing it objectively. And if we take a very dissimilar language, this language becomes a part of nature, and we even do to it what we have already done to nature. We tend to think in our own language in order to examine the exotic language. Or we find the task of unraveling the purely morphological intricacies so gigantic that it seems to absorb all else. Yet the problem, though difficult, is feasible; and the best approach is through an exotic language, for in its study we are at long last pushed willy-nilly out of our ruts. Then we find that the exotic language is a mirror held up to our own.⁶

In my study of the Hopi language, what I now see as an opportunity to work on this problem was first thrust upon me before I was clearly aware of the problem. The seemingly endless task of describing the morphology did finally end. Yet it was evident, especially in the light of Sapir's lectures on Navaho, that the description of the *language* was far from complete. I knew for example the morphological formation of plurals, but not how to use plurals. It was evident that the category of plural in Hopi was not the same thing as in English, French, or German. Certain things that were plural in these languages were singular in Hopi. The phase of investigation which now began consumed nearly two more years. The work began to assume the character of a com-

parison between Hopi and western European languages. It also became evident that even the grammar of Hopi bore a relation to Hopi culture, and the grammar of European tongues to our own "Western" or "European" culture. And it appeared that the interrelation brought in those large subsummations of experience by language, such as our own terms "time," "space," "substance," and "matter." Since, with respect to the traits compared, there is little difference between English, French, German, or other European languages with the possible (but doubtful) exception of Balto-Slavic and non-Indo-European, I have lumped these languages into one group called SAE, or "Standard Average European."⁷

That portion of the whole investigation here to be reported may be summed up in two questions: (1) Are our own concepts of "time," "space," and "matter" given in substantially the same form by experience to all men, or are they in part conditioned by the structure of particular languages? (2) Are there traceable affinities between (a) cultural and behavioral norms and (b) large-scale linguistic patterns? I should be the last to pretend that there is anything so definite as "a correlation" between culture and language, and especially between ethnological rubrics such as "agricultural, hunting," etc., and linguistic ones like "inflected," "synthetic," or "isolating."^a When I began the study, the

5. *Non est disputandum*: Latin, "is not disputable." Generally seen as *de gustibus non est disputandum*: "There is no accounting for taste."

6. Whorf is suggesting that it is very difficult to understand the effects of language on culture because people perceive the world through their own languages, which are filled with fundamental assumptions about the nature of the world. Similarly, it is difficult to study the linguistic categories of another language because we must ultimately perceive these through the linguistic categories of our own. Whorf suggests that the despite our tendency to see it in our own terms, the study of exotic languages is the best way around this problem. Additionally, such study can give us a new point of view from which to examine our own.

7. European scholars have been speculating about the nature of language and cognition and the differences between languages since the late seventeenth century. Echoing the Boasian rejection of unilineal-evolutionary thinking and the related ranking of races that was common at the time, Sapir and Whorf rejected the ranking of cultures or languages. Here Whorf begins to use his concept of linguistic relativity, the notion that different languages reflect different cultural conceptions of reality. He aims to demonstrate that European concepts of time, space, and matter are not universal, but take different conceptual forms in various cultures and that these differences are the result of language.

Note that Whorf has decided to lump all European languages together. However, there are differences among these languages of the sort he has mentioned above. For example, business, hair, and darkness are singular in English but plural in French (*les affaires*, *les cheveux*, and *les ténèbres*, respectively).

problem was by no means so clearly formulated, and I had little notion that the answers would turn out as they did.

PLURALITY AND NUMERATION IN SAE AND HOPI

In our language, that is SAE, plurality and cardinal numbers are applied in two ways: to real plurals and imaginary plurals. Or more exactly if less tersely: perceptible spatial aggregates and metaphorical aggregates. We say "ten men" and also "ten days." Ten men either are or could be objectively perceived as ten, ten in one group perception^b—ten men on a street corner, for instance. But "ten days" cannot be objectively experienced. We experience only one day, today; the other nine (or even all ten) are something conjured up from memory or imagination. If "ten days" be regarded as a group it must be as an "imaginary," mentally constructed group. Whence comes this mental pattern? Just as in the case of the fire-causing errors, from the fact that our language confuses the two different situations, has but one pattern for both. When we speak of "ten steps forward, ten strokes on a bell," or any similarly described cyclic sequence, "times" of any sort, we are doing the same thing as with "days." Cyclicity brings the response of imaginary plurals. But a likeness of cyclicity to aggregates is not unmistakably given by experience prior to language, or it would be found in all languages, and it is not.⁸

Our awareness of time and cyclicity does contain something immediate and subjective—

the basic sense of "becoming later and later." But, in the habitual thought of us SAE people, this is covered under something quite different, which though mental should not be called subjective. I call it *objectified*, or imaginary, because it is patterned on the *outer* world. It is this that reflects our linguistic usage. Our tongue makes no distinction between numbers counted on discrete entities and numbers that are simply "counting itself." Habitual thought then assumes that in the latter the numbers are just as much counted on "something" as in the former. This is objectification. Concepts of time lose contact with the subjective experience of "becoming later" and are objectified as counted *quantities*, especially as lengths, made up of units as a length can be visibly marked off into inches. A "length of time" is envisioned as a row of similar units, like a row of bottles.⁹

In Hopi there is a different linguistic situation. Plurals and cardinals are used only for entities that form or can form an objective group. There are no imaginary plurals, but instead ordinals used with singulars. Such an expression as "ten days" is not used. The equivalent statement is an operational one that reaches one day by a suitable count. "They stayed ten days" becomes "they stayed until the eleventh day" or "they left after the tenth day." "Ten days is greater than nine days" becomes "the tenth day is later than the ninth." Our "length of time" is not regarded as a length but as a relation between two events in lateness. Instead of our linguistically promoted objectification of that datum of consciousness we call "time," the Hopi language has not laid down any pattern that would cloak the subjective "becoming later" that is the essence of time.¹⁰

8. In this section Whorf argues that SAE speakers use the same grammatical construction for physical things that we can experience at a single time such as "ten men" and things that we can only experience as a sequence such as ten days. He refers to the first of these as "real" plurals and the second as "imaginary" plurals.

9. Whorf claims that because SAE speakers treat the abstract concept of numbers, particularly numbers of days, as if they were physical objects, SAE speakers have constructed a linear concept of time as a line of units that stretches out before us into the future and behind us in the past. He makes this point because he is preparing readers for a discussion of the cyclical nature of time in Hopi thought.

10. Whorf asserts that while speakers of SAE think of time as an imaginary plural—e.g., "ten days"—speakers of Hopi think of it as a series of concrete events, day following day, getting later. In McGee's experience, a similar situation exists in Lacandon Maya. When speaking in Maya, many Lacandon talk of time

NOUNS QUANT AND H

We have two things: individual water, milk, Individual n outlines: a n nouns denote implied bound by linguistic rals,^c in Eng take the part tion is m in the observ few natural o unbounded e water, rain, s not encounte or most "mat tion, but in b outlines. The upon our desc able pattern in in a great ma of individualiz gnostic devices body-types: sti of glass, cake i introducing na contents be th of coffee, dish beer. These ve in which "of" h ble meaning ("c about the less stick of wood, l las are very simi

in terms of phase: this as "half a m experience one d One can watch th

11. In this sect individualize then However, he claim imply outline size because in the cas "puddle," "pond,"

NOUNS OF PHYSICAL QUANTITY IN SAE AND HOPI

We have two kinds of nouns denoting physical things: individual nouns, and mass nouns, e.g., water, milk, wood, granite, sand, flour, meat. Individual nouns denote bodies with definite outlines: a tree, a stick, a man, a hill. Mass nouns denote homogeneous continua without implied boundaries. The distinction is marked by linguistic form; e.g., mass nouns lack plurals,⁸ in English drop articles, and in French take the partitive article *du, de la, des*. The distinction is more widespread in language than in the observable appearance of things. Rather few natural occurrences present themselves as unbounded extents; air of course, and often water, rain, snow, sand, rock, dirt, grass. We do not encounter butter, meat, cloth, iron, glass, or most "materials" in such kind of manifestation, but in bodies small or large with definite outlines. The distinction is somewhat forced upon our description of events by an unavoidable pattern in language. It is so inconvenient in a great many cases that we need some way of individualizing the mass noun by further linguistic devices. This is partly done by names of body-types: stick of wood, piece of cloth, pane of glass, cake of soap; also, and even more, by introducing names of containers though their contents be the real issue: glass of water, cup of coffee, dish of food, bag of flour, bottle of beer. These very common container formulas, in which "of" has an obvious, visually perceptible meaning ("contents"), influence our feeling about the less obvious type-body formulas: stick of wood, lump of dough, etc. The formulas are very similar: individual noun plus a sim-

ilar relator (English "of"). In the obvious case this relator denotes contents. In the inobvious one it "suggests" contents. Hence the lumps, chunks, blocks, pieces, etc., seem to contain something, a "stuff," "substance," or "matter" that answers to the water, coffee, or flour in the container formulas. So with SAE people the philosophic "substance" and "matter" are also the naïve idea; they are instantly acceptable, "common sense." It is so through linguistic habit. Our language patterns often require us to name a physical thing by a binomial that splits the reference into a formless item plus a form.

Hopi is again different. It has a formally distinguished class of nouns. But this class contains no formal subclass of mass nouns. All nouns have an individual sense and both singular and plural forms. Nouns translating most nearly our mass nouns still refer to vague bodies or vaguely bounded extents. They imply indefiniteness, but not lack, of outline and size. In specific statements, "water" means one certain mass or quantity of water, not what we call "the substance water." Generality of statement is conveyed through the verb or predicator, not the noun. Since nouns are individual already, they are not individualized by either type-bodies or names of containers, if there is no special need to emphasize shape or container. The noun itself implies a suitable type-body or container. One says, not "a glass of water" but *kə yi* "a water," not "a pool of water" but *pa hə*,⁹ not "a dish of corn flour" but *n^mmni* "a (quantity of) corn flour," not "a piece of meat" but *sik^{wi}* "a meat." The language has neither need for nor analogies on which to build the concept of existence as a duality of formless item and form. It deals with formlessness through other symbols than nouns.¹¹

in terms of phases of the moon. For example, if McGee is staying in a community for two weeks, they describe this as "half a moon." Two weeks is an imaginary plural, fourteen days lined up in front of us that we will experience one day at a time. But the phases of the moon are something that can be concretely experienced. One can watch the moon through its cycle.

11. In this section Whorf says that SAE has mass nouns such as "glass" and "water" that require us to individualize them by adding a qualifier such as "pane of glass" or a container such as "glass of water." However, he claims that Hopi has no mass nouns; rather, Hopi nouns for indefinite objects such as water imply outline size or quantity. It is curious that Whorf chooses the example of "water" to illustrate this point, because in the case of "water" in English, one can construct nouns in the same manner as Hopi. The nouns "puddle," "pond," and "lake" all imply a certain size and quantity of water. "Twig," "stick," and "board" are

PHASES OF CYCLES IN SAE AND HOPI

Such terms as summer, winter, September, morning, noon, sunset are with us nouns, and have little formal linguistic difference from other nouns. They can be subjects or objects, and we say "at" sunset or "in" winter just as we say at a corner or in an orchard.¹² They are pluralized and numerated like nouns of physical objects, as we have seen. Our thought about the referents of such words hence becomes objectified. Without objectification, it would be a subjective experience of real time, i.e. of the consciousness of "becoming later and later"—simply a cyclic phase similar to an earlier phase in that ever-later-becoming duration. Only by imagination can such a cyclic phase be set beside another and another in the manner of a spatial (i.e., visually perceived) configuration. But such is the power of linguistic analogy that we do so objectify cyclic phasing. We do it even by saying "a phase" and "phases" instead of, e.g., "phasing." And the pattern of individual and mass nouns, with the resulting binomial formula of formless item plus form, is so general that it is implicit for all nouns, and hence our very generalized formless items like "substance," "matter," by which we can fill out the binomial for an enormously wide range of nouns. But even these are not quite generalized enough to take in our phase nouns. So for the phase nouns we have made a formless item, "time." We have made it by using "a time," i.e. an occasion or a phase, in the pattern of a mass noun, just as from "a summer" we make "summer" in the pattern of a mass noun. Thus with our binomial formula

we can say and think "a moment of time," "a second of time," "a year of time." Let me again point out that the pattern is simply that of "a bottle of milk" or "a piece of cheese." Thus we are assisted to imagine that "a summer" actually contains or consists of such-and-such a quantity of "time."

In Hopi however all phase terms, like summer, morning, etc., are not nouns but a kind of adverb, to use the nearest SAE analogy. They are a formal part of speech by themselves, distinct from nouns, verbs, and even other Hopi "adverbs." Such a word is not a case form or a locative pattern, like "des Abends"¹² or "in the morning." It contains no morpheme like one of "in the house" or "at the tree." It means "when it is morning" or "while morning-phase is occurring." These "temporals" are not used as subjects or objects, or at all like nouns. One does not say "it's a hot summer" or "summer is hot"; summer is not hot, summer is only *when* conditions are hot, *when* heat occurs. One does not say "this summer," but "summer now" or "summer recently." There is no objectification, as a region, an extent, a quantity, of the subjective duration-feeling. Nothing is suggested about time except the perpetual "getting later" of it. And so there is no basis here for a formless item answering to our "time."¹³

TEMPORAL FORMS OF VERBS IN SAE AND HOPI

The three tense system of SAE verbs colors all our thinking about time. This system is amalgamated with that large scheme of objectification of the subjective experience of duration already

other examples in the case of "wood." Maybe the differences between SAE and Hopi noun construction are not as absolute as Whorf claims.

12. *Des Abends*: German, "in the evening."

13. Building on his discussions of plurality and mass nouns, Whorf proposes here that SAE terminology for phases of time such as summer or morning treat these imaginary nouns as if they were a quantity of concrete, observable items. In fact, in the Western calendar the seasons are specific series of days that disregard local environmental conditions. This is another example of the Western objectification of time. In contrast, Whorf says the Hopi use phase terms in the manner of adverbs. For example, summer is not hot (because summer is not a concrete thing that contains heat). Summer for the Hopi is when conditions are hot. Whorf asserts that, unlike SAE, Hopi is a concrete language that reflects people's physical experience. This is a point that is dealt with in greater detail in the next section in the discussion of verb forms.

noted in other I
mula applicable
ral nouns, in pl
objectification e
"stand time uni
time as like a ro
three tenses; wh
lier and a later, v
ter to the feelin
enced. For if we
no past, present,
complexity. Every
everything in con
There is in it a s
We may call tl
seeing, hearing, t
in the nonsensu
memory is being l
realm of belief, ir
future"; yet sensi
are in consciousn
to be" nor anothe
real time comes i
ness is "getting le
tions in an irreve
ing" or "during"
paramount contra
instant at the foc
the earlier. Langu
well with two ter
this paramount re
can of course co
thought a system o
objectified config

14. Here, Whorf f
and future related to
tenses learned, cultu
Whorf points out
past, present, or futu
(past), sensations (p
example of the way t
different, as Whorf ex
Besides outlining
implications. Whorf is
ries: the "sensuous,"
else (memories, antic
tenses out of this ph
that actually exists is
is consistent with Bo
ings are created by ci
particular ways.

noted in other patterns—in the binomial formula applicable to nouns in general, in temporal nouns, in plurality and numeration. This objectification enables us in imagination to “stand time units in a row.” Imagination of time as like a row harmonizes with a system of *three* tenses; whereas a system of two, an earlier and a later, would seem to correspond better to the feeling of duration as it is experienced. For if we inspect consciousness we find no past, present, future, but a unity embracing complexity. *Everything* is in consciousness, and everything in consciousness is, and is together. There is in it a sensuous and a nonsensuous. We may call the sensuous—what we are seeing, hearing, touching—the “present” while in the nonsensuous the vast image-world of memory is being labeled “the past” and another realm of belief, intuition, and uncertainty “the future”; yet sensation, memory, foresight, all are in consciousness together—one is not “yet to be” nor another “once but no more.” Where real time comes in is that all this in consciousness is “getting later,” changing certain relations in an irreversible manner. In this “latering” or “durating” there seems to me to be a paramount contrast between the newest, latest instant at the focus of attention and the rest—the earlier. Languages by the score get along well with two tense-like forms answering to this paramount relation of later to earlier. We can of course *construct and contemplate in thought* a system of past, present, future, in the objectified configuration of points on a line.

This is what our general objectification tendency leads us to do and our tense system confirms.

In English the present tense seems the one least in harmony with the paramount temporal relation. It is as if pressed into various and not wholly congruous duties. One duty is to stand as objectified middle term between objectified past and objectified future, in narration, discussion, argument, logic, philosophy. Another is to denote inclusion in the sensuous field: “I see him.” Another is for nomic, i.e. customarily or generally valid, statements: “We see with our eyes.” These varied uses introduce confusions of thought, of which for the most part we are unaware.¹⁴

Hopi, as we might expect, is different here too. Verbs have no “tenses” like ours, but have validity-forms (“assertions”), aspects, and clause-linkage forms (modes), that yield even greater precision of speech. The validity-forms denote that the speaker (not the subject) reports the situation (answering to our past and present) or that he expects it (answering to our future)* or that he makes a nomic statement (answering to our nomic present). The aspects denote different degrees of duration and different kinds of tendency “during duration.” As yet we have noted nothing to indicate whether an event is sooner or later than another when both are *reported*. But need for this does not arise until we have two verbs: i.e., two clauses. In that case the “modes” denote relations between the clauses, including relations of later

14. Here, Whorf focuses on an important, and very Boasian, debate: Are notions such as past, present, and future related to aspects of human physiology, or is human behavior virtually completely flexible? Are tenses learned, cultural phenomena?

Whorf points out that SAE requires one to think and speak in a three-tense system. However, there is no past, present, or future in our consciousness. We live in a continual present and experience our memories (past), sensations (present), and anticipation of things (future) all together in “real time.” This is another example of the way that SAE steers its speakers toward the Western objectification of time. Hopi, however, is different, as Whorf explains later.

Besides outlining how he thinks Hopi speakers understand the world, Whorf’s claim has much larger implications. Whorf is saying that the physical phenomenon of consciousness can be divided into two categories: the “sensuous,” which is, what we are experiencing at this instant, and the “nonsensuous,” everything else (memories, anticipations, anxieties, and so on). Because of the structure of our language, we carve three tenses out of this phenomenon: past, present, and future. In fact, as a physical phenomenon, the only thing that actually exists is the process of getting later. In this, Whorf understands consciousness in a fashion that is consistent with Boasian thinking. Consciousness is essentially undifferentiated, a blank slate. Understandings are created by culture and environment rather than by any preexisting tendency of the brain to work in particular ways.

to earlier and of simultaneity. Then there are many detached words that express similar relations, supplementing the modes and aspects. The duties of our three-tense system and its tripartite linear objectified "time" are distributed among various verb categories, all different from our tenses; and there is no more basis for an objectified time in Hopi verbs than in other Hopi patterns; although this does not in the least hinder the verb forms and other patterns from being closely adjusted to the pertinent realities of actual situations.¹⁵

[In a 590-word section titled "Duration, Intensity, and Tendency in SAE and Hopi," Whorf shows that these are expressed metaphorically in SAE. For example, an event that concludes quickly is "short." Prices "rise and fall." An injured person may suffer a "sharp" pain. Whorf concludes that this demonstrates the way that SAE objectifies or spatializes qualities and events that are not concrete or spatial. He says SAE speakers have difficulty referring to nonspatial situations without physical metaphors. For example, do you "grasp" this point, or is it "over your head"? Whorf concludes by saying that the Hopi language does not use these physical metaphors because Hopi has "tensors," a class of words that denotes intensity, tendency, and duration.]

HABITUAL THOUGHT IN SAE AND HOPI

The comparison now to be made between the habitual thought worlds of SAE and Hopi speakers is of course incomplete. It is possible only to touch upon certain dominant contrasts that appear to stem from the linguistic differences already noted. By "habitual thought" and "thought world" I mean more than simply language, i.e., than the linguistic patterns themselves. I include all the analogical and suggestive value of the patterns (e.g., our "imaginary space" and its distant implications), and all the give-and-take between language and the culture as a whole, wherein is a vast amount that is not linguistic but yet shows the shaping influence of language. In brief, this "thought world" is the microcosm that each man carries about within himself, by which he measures and understands what he can of the macrocosm.¹⁶

The SAE microcosm has analyzed reality largely in terms of what it calls "things" (bodies and quasibodies) plus modes of extensional but formless existence that it calls "substances" or "matter." It tends to see existence through a binomial formula that expresses any existent as a spatial form plus a spatial formless continuum related to the form, as contents is related to the outlines of its container. Nonspatial existents

are imaginative similar implicat

The Hopi analyzed reality largely ("eventing"), ref and subjective. tible physical ex mainly as outli other perceptive the physical and sidered the expro tors, on which sistance, or their It implies that e and later" all in by growing like vanishing, some phoses, some by fected by violent existent able to i the power of it: growth, decline, ness. Everything the way it now m what it will be lat is in act of being and importance r prepared aspect Hopi correspond "matter" or "stuff

15. As Whorf indicates, many languages like Hopi have two tense forms (past and present) and numerous aspect forms that indicate duration or whether an action is about to happen, is ongoing, or has been completed.

Whorf has given us a series of examples of differences between SAE and Hopi including plurality, physical quantity, phases and cycles, and verb tenses. He asserts that these reflect differences in understanding rather than simply being simply different ways of expressing the same thing. This, however, is quite difficult to prove. Consider an example from plurality. In English we say, "I wear a shirt and a pair of pants." Following Whorf, this should indicate that we experience and understand shirts and pants in fundamentally different ways (apart from their obviously different uses).

16. Up to this point Whorf has spent his time (whoops, another metaphor objectifying time as a quantity) discussing how SAE and Hopi grammatical categories are different. In this section he now turns his attention to the relationship between language, thought, and behavior. Whorf argues that cultural differences are not simply reflected in language. Rather, the cultural differences "stem from" linguistic differences. He proposes that each person carries a "thought world," shaped by language, internally, through which the person understands the surrounding world.

In the discussion that follows, Whorf proposes that language and culture are homogeneous phenomena. An individual is born into both, and they are largely responsible for shaping his or her worldview. This notion of the thought world is similar to the concept put forth by Ruth Benedict (1887–1948) of a *cultural configuration* (see essay 10). Benedict's *Patterns of Culture* was published in 1934, just at the time Whorf was formulating his thoughts on the role of language in anthropology. It is clear here that Whorf was familiar with Benedict's work. Both Whorf and Benedict were close friends of Sapir and shared his interests in the relationship between psychology and culture.

HABITUAL FEATURES CULTURE

Our behavior, and be coordinated in

17. "Fugitiveness"

18. In other word an interesting point, larly the phenomeno both published work Husserl *Lectures on* various objective and

19. In this section that as with the insu talk, and he provides Whorf is firmly Bc position Franz Boas

are imaginatively spatialized and charged with similar implications of form and continuum.

The Hopi microcosm seems to have analyzed reality largely in terms of *events* (or better "eventing"), referred to in two ways, objective and subjective. Objectively, and only if perceptible physical experience, events are expressed mainly as outlines, colors, movements, and other perceptive reports. Subjectively, for both the physical and nonphysical, events are considered the expression of invisible intensity factors, on which depend their stability and persistence, or their fugitiveness and proclivities.¹⁷ It implies that existents do not "become later and later" all in the same way; but some do so by growing like plants, some by diffusing and vanishing, some by a procession of metamorphoses, some by enduring in one shape till affected by violent forces. In the nature of each existent able to manifest as a definite whole is the power of its own mode of duration: its growth, decline, stability, cyclicity, or creativeness. Everything is thus already "prepared" for the way it now manifests by earlier phases, and what it will be later, partly has been, and partly is in act of being so "prepared." An emphasis and importance rests on this preparing or being prepared aspect of the world that may to the Hopi correspond to that "quality of reality" that "matter" or "stuff" has for us.¹⁸

HABITUAL BEHAVIOR FEATURES OF HOPI CULTURE

Our behavior, and that of Hopi, can be seen to be coordinated in many ways to the linguisti-

cally conditioned microcosm. As in my fire casebook, people act about situations in ways which are like the ways they talk about them. A characteristic of Hopi behavior is the emphasis on preparation. This includes announcing and getting ready for events well beforehand, elaborate precautions to insure persistence of desired conditions, and stress on good will as the preparer of right results. Consider the analogies of the day-counting pattern alone. Time is mainly reckoned "by day" (*taLk*, *-tala*) or "by night" (*tok*), which words are not nouns but tensors, the first formed on a root "light, day," the second on a root "sleep." The count is by *ordinals*. This is not the pattern of counting a number of different men or things, even though they appear successively, for, even then, they *could* gather into an assemblage. It is the pattern of counting successive reappearances of the *same* man or thing, incapable of forming an assemblage. The analogy is not to behave about day-cyclicity as to several men ("several days"), which is what we tend to do, but to behave as to the successive visits of the *same man*. One does not alter several men by working upon just one, but one can prepare and so alter the later visits of the same man by working to affect the visit he is making now. This is the way the Hopi deal with the future—by working within a present situation which is expected to carry impresses, both obvious and occult, forward into the future event of interest. One might say that Hopi society understands our proverb "Well begun is half done," but not our "Tomorrow is another day." This may explain much in Hopi character.¹⁹

This Hopi preparing behavior may be roughly

17. "Fugitiveness and proclivities": in this context, instabilities and tendencies.

18. In other words, whereas SAE is characterized by "being," Hopi is characterized by "becoming." This is an interesting point, because Whorf's concerns here dovetail key interests of philosophers of his era, particularly the phenomenologists. Edmund Husserl (1859–1938) and his student Martin Heidegger (1889–1976) had both published works on the nature of time in the 1920s. Heidegger published *Being and Time* in 1927 and Husserl *Lectures on the Phenomenology of Internal Time Consciousness* in 1928. In these works they explore various objective and subjective experiences of time.

19. In this section Whorf seeks to make the connection between Hopi language and behavior. He says that as with the insurance cases he has investigated, the Hopi act in ways that are similar to the way they talk, and he provides several examples that contrast the Hopi point of view with that of SAE speakers.

Whorf is firmly Boasian in using Hopi language as a way of explaining the Hopi worldview. This was a position Franz Boas (1858–1942) first formulated in 1911 in the introduction to his *Handbook of American*

divided into announcing, outer preparing, inner preparing, covert participation, and persistence. Announcing, or preparative publicity, is an important function in the hands of a special official, the Crier Chief. Outer preparing is preparation involving much visible activity, not all necessarily directly useful within our understanding. It includes ordinary practicing, rehearsing, getting ready, introductory formalities, preparing of special food, etc. (all of these to a degree that may seem overelaborate to us), intensive sustained muscular activity like running, racing, dancing, which is thought to increase the intensity of development of events (such as growth of crops), mimetic and other magic, preparations based on esoteric theory involving perhaps occult instruments like prayer sticks, prayer feathers, and prayer meal, and finally the great cyclic ceremonies and dances, which have the significance of preparing rain and crops. From one of the verbs meaning "prepare" is derived the noun for "harvest" or "crop": *na'twani* "the prepared" or the "in preparation."²⁰

Inner preparing is use of prayer and meditation, and at lesser intensity good wishes and good will, to further desired results. Hopi attitudes stress the power of desire and thought. With their "microcosm" it is utterly natural that they should. Desire and thought are the earliest, and therefore the most important, most critical and crucial, stage of preparing. Moreover, to the Hopi, one's desires and thoughts influence not only his own actions, but all nature as well. This too is wholly natural. Consciousness itself is aware of work, of the feel of effort and energy, in desire and thinking. Experience more basic than language tells us that, if energy is expended, effects are produced. We tend to believe that our bodies can stop up this energy, prevent it from affecting other things until we will our bodies to overt action. But this may be so only

because we have our own linguistic basis for a theory that formless items like "matter" are things in themselves, malleable only by similar things, by more matter, and hence insulated from the powers of life and thought. It is no more unnatural to think that thought contacts everything and pervades the universe than to think, as we all do, that light kindled outdoors does this. And it is not unnatural to suppose that thought, like any other force, leaves everywhere traces of effect. Now, when we *think* of a certain actual rosebush, we do not suppose that our thought goes to that actual bush, and engages with it, like a searchlight turned upon it. What then do we suppose our consciousness is dealing with when we are thinking of that rosebush? Probably we think it is dealing with a "mental image" which is not the rosebush but a mental surrogate of it. But why should it be *natural* to think that our thought deals with a surrogate and not with the real rosebush? Quite possibly because we are dimly aware that we carry about with us a whole imaginary space, full of mental surrogates. To us, mental surrogates are old familiar fare. Along with the images of imaginary space, which we perhaps secretly know to be imaginary only, we tuck the thought-of actually existing rosebush, which may be quite another story, perhaps just because we have that very convenient "place" for it. The Hopi thought-world has no imaginary space. The corollary to this is that it may not locate thought dealing with real space anywhere but in real space, nor insulate real space from the effects of thought. A Hopi would naturally suppose that his thought (or he himself) traffics with the actual rosebush—or more likely, corn plant—that he is thinking about. The thought then should leave some trace of itself with the plant in the field. If it is a good thought, one about health and growth, it is good for the plant; if a bad thought, the reverse.²⁰

Indian Languages. However, unlike Boas and following Sapir, Whorf believed that psychology (rather than history) provided the explanatory tools that anthropology needed to analyze the relationship between humans and culture, and he saw linguistics as the bridge between anthropology and psychology.

20. This section is a brilliant example of culturally relativistic writing, and we want to draw your attention to the skill with which Whorf explains how a Hopi views his place in the world. Boas believed that one of the goals of anthropology was to understand the "native" worldview. Here Whorf not only explains the Hopi view of things, he does it in such a way that highlights the contrasts between Hopi and SAE and makes Hopi seem reasonable. It is good to point out here that the clarity of Whorf's presentation does not mean he was correct.

The Hopi emphasize thought. Thought must be vivid in consciousness, sustained, charged with intentions. They render it concentrating, "holding your mind on it," "power is the force of sticks, ritual smoking regarded as an aid to my informant). Its instrument of preparation

Covert participation from people who do affair, be it a job of money, but direct the toward the affair's ; often seek to enlist the helpers as well as o contain exhortations their active good will cepts of a sympathetic ing section at a footl scure the fact that it directed thought, and encouragement, that ticipants. In fact these est work before, not d lary to the power of wrong thought for evi covert participation is of many good wisher thought of ill-wishers favor cooperation and that the Hopi commun and colliding interests.

Linguists and psychologists without reaching any defi

21. Note the similarity particularly among Evange

22. Here Whorf uses h of thought to make sense differently than SAE, repet SAE speakers as a result therefore do not see the s Whorf over his observation religious ceremony all over at the life of people in Cat are structured around a re

The Hopi emphasize the intensity-factor of thought. Thought to be most effective should be vivid in consciousness, definite, steady, sustained, charged with strongly felt good intentions. They render the idea in English as "concentrating," "holding it in your heart," "putting your mind on it," "earnestly hoping." Thought power is the force behind ceremonies, prayer sticks, ritual smoking, etc. The prayer pipe is regarded as an aid to "concentrating" (so said my informant). Its name, *na'twanpi*, means "instrument of preparing."

Covert participation is mental collaboration from people who do not take part in the actual affair, be it a job of work, hunt, race, or ceremony, but direct their thought and good will toward the affair's success. Announcements often seek to enlist the support of such mental helpers as well as of overt participants, and contain exhortations to the people to aid with their active good will.²¹ A similarity to our concepts of a sympathetic audience or the cheering section at a football game should not obscure the fact that it is primarily the power of directed thought, and not merely sympathy or encouragement, that is expected of covert participants. In fact these latter get in their deadliest work before, not during, the game! A corollary to the power of thought is the power of wrong thought for evil; hence one purpose of covert participation is to obtain the mass force of many good wishers to offset the harmful thought of ill-wishers. Such attitudes greatly favor cooperation and community spirit. Not that the Hopi community is not full of rivalries and colliding interests. Against the tendency to

social disintegration in such a small, isolated group, the theory of "preparing" by the power of thought, logically leading to the great power of the combined, intensified, and harmonized thought of the whole community, must help vastly toward the rather remarkable degree of cooperation that, in spite of much private bickering, the Hopi village displays in all the important cultural activities.²¹

Hopi "preparing" activities again show a result of their linguistic thought background in an emphasis on persistence and constant insistent repetition. A sense of the cumulative value of innumerable small momenta is dulled by an objectified, spatialized view of time like ours, enhanced by a way of thinking close to the subjective awareness of duration, of the ceaseless "latering" of events. To us, for whom time is a motion on a space, unvarying repetition seems to scatter its force along a row of units of that space, and be wasted. To the Hopi, for whom time is not a motion but a "getting later" of everything that has ever been done, unvarying repetition is not wasted but accumulated. It is storing up an invisible change that holds over into later events.²² As we have seen, it is as if the return of the day were felt as the return of the same person, a little older but with all the impresses of yesterday, not as "another day," i.e. like an entirely different person. This principle joined with that of thought-power and with traits of general Pueblo culture is expressed in the theory of the Hopi ceremonial dance for furthering rain and crops, as well as in its short, piston-like tread, repeated thousands of times, hour after hour.²²

Linguists and psychologists have been experimenting with different aspects of Whorf's ideas for half a century without reaching any definitive conclusions.

21. Note the similarity between Hopi notions of thought and many current American notions of prayer, particularly among Evangelical Christians.

22. Here Whorf uses his discussion of the Hopi conception of time and their views on the physical power of thought to make sense of Hopi ritual activity. He says that because their language treats time fundamentally differently than SAE, repetition, for the Hopi, is an essential part of ceremonies. However, Whorf claims that SAE speakers as a result of their language cannot conceive of time in this "becoming later" fashion and therefore do not see the same value to repetition as do the Hopi. We are not in a position to quibble with Whorf over his observations of the Hopi, but we feel that Whorf overlooked the history of traditional Christian religious ceremony all over Europe. Much Christian ritual activity involves repetition. It would be hard to look at the life of people in Catholic monastic orders, for example, and not see that the lives of monks and nuns are structured around a repetitive prayer and ritual cycle. Catholic penance may involve repeated sayings of

SOME IMPRESSES OF LINGUISTIC HABIT IN WESTERN CIVILIZATION

It is harder to do justice in few words to the linguistically conditioned features of our own culture than in the case of the Hopi, because of both vast scope and difficulty of objectivity—because of our deeply ingrained familiarity with the attitudes to be analyzed. I wish merely to sketch certain characteristics adjusted to our linguistic binomialism of form plus formless item or “substance,” to our metaphoricalness, our imaginary space, and our objectified time. These, as we have seen, are linguistic.

From the form-plus-substance dichotomy the philosophical views most traditionally characteristic of the “Western world” have derived huge support. Here belong materialism, psychophysical parallelism, physics at least in its traditional Newtonian form—and dualistic views of the universe in general. Indeed here belongs almost everything that is “hard, practical common sense.” Monistic,²³ holistic, and relativistic views of reality appeal to philosophers and some scientists, but they are badly handicapped in appealing to the “common

sense” of the Western average man—not because nature herself refutes them (if she did, philosophers could have discovered this much), but because they must be talked about in what amounts to a new language. “Common sense,” as its name shows, and “practicality” as its name does not show, are largely matters of talking so that one is readily understood. It is sometimes stated that Newtonian space, time, and matter are sensed by everyone intuitively, whereupon relativity is cited as showing how mathematical analysis can prove intuition wrong. This, besides being unfair to intuition, is an attempt to answer offhand question (1) put at the outset of this paper, to answer which this research was undertaken. Presentation of the findings now nears its end, and I think the answer is clear. The offhand answer, laying the blame upon intuition for our slowness in discovering mysteries of the Cosmos, such as relativity, is the wrong one. The right answer is: Newtonian space, time, and matter are no intuitions. They are receipts [sic] from culture and language. That is where Newton got them.²⁴

Our objectified view of time is, however, favorable to historicity and to everything connected with the keeping of records, while the

specific prayers. The last line in this paragraph could apply equally well to Christian pilgrims, whose every footstep may be considered a prayer.

23. “Monism”: the philosophical principle that mind and matter are essentially the same.

24. Because he studied engineering Whorf had a better background in the physical sciences than most of his colleagues, and he continued to follow developments in the sciences throughout his career. He was familiar with Albert Einstein’s work on relativity and saw a link between relativity in physics and cultural relativity in the study of human societies, namely, that “reality” depends on the positioning of the observer. Here this leads him to an extremely radical claim: that we experience Newtonian physics (things such as the effects of gravity, the consistency of time, or mass) not because these things are “real” but because our language and culture cause us to perceive and believe them. By implication, if we had a different language and culture (like the Hopi) we might perceive what SAE speakers call time, gravity, and mass differently. It’s an intriguing notion, and one needs to be careful not to misunderstand his point. Whorf is not arguing here that the physical laws that govern the universe are different in different cultures because people speak differently, but that the cultural reality or how events are defined may be different.

Whorf is arguing a linguistic version of cultural relativity. However, his work is closer than most Boasians to *hermeneutics*, the study of the interpretation of meaning. Hermeneutics was developed in Europe in the early twentieth century by philosophers such as Heidegger and Hans-Georg Gadamer (1900–2002). Hermeneuticists argued that one could not have objective knowledge about the world because people necessarily understood the world through their cultural, linguistic, and intellectual models.

In American anthropology Boas and his students used the notion of cultural relativity to argue against racism and discrimination and to support the notion of cultural equality. Unfortunately, in post-World War I Germany political leaders used ideas from hermeneutics to argue for German cultural superiority, which led to a rise in nationalism, anti-Semitism, and the ascendance of Hitler and the National Socialist Party.

Hopi view is unfavo too subtle, complex, plying no ready-made when “one” event e When it is implicit th pened still is, but is form from what men is less incentive to present, the incentiv but to treat it as “pre time puts before im ribbon or scroll ma spaces, suggesting t entry. Writing has n linguistic treatment c tic treatment has g Through this give-a and the whole cultur

1. Records, diarie mathematics s
2. Interest in exa dars, chronol time graphs, ti
3. Annals, histor interest in th tudes of introj e.g., classicism

Just as we conce extending in the fut extends in the past, mates of the future records of the pa schedules, budgets. spacelike units by w

25. Whorf mention languages lent themse stand time. Writing w generation later schol that the process of wri literacy transforms th particular chides Whor are written languages

Note that Whorf’s r ern theorists would pi gence of state-level sc

26. “Prorata”: pro

27. Here Whorf su reinforces our “well-w

Hopi view is unfavorable thereto. The latter is too subtle, complex, and ever-developing, supplying no ready-made answer to the question of when "one" event ends and "another" begins. When it is implicit that everything that ever happened still is, but is in a necessarily different form from what memory or record reports, there is less incentive to study the past. As for the present, the incentive would be not to record it but to treat it as "preparing." But *our* objectified time puts before imagination something like a ribbon or scroll marked off into equal blank spaces, suggesting that each be filled with an entry. Writing has no doubt helped toward our linguistic treatment of time, even as the linguistic treatment has guided the uses of writing. Through this give-and-take between language and the whole culture we get, for instance:

1. Records, diaries, bookkeeping, accounting, mathematics stimulated by accounting.
2. Interest in exact sequence, dating, calendars, chronology, clocks, time wages, time graphs, time as used in physics.
3. Annals, histories, the historical attitude, interest in the past, archaeology, attitudes of introjection toward past periods, e.g., classicism, romanticism.²⁵

Just as we conceive our objectified time as extending in the future in the same way that it extends in the past, so we set down our estimates of the future in the same shape as our records of the past, producing programs, schedules, budgets. The formal equality of the spacelike units by which we measure and con-

ceive time leads us to consider the "formless item" or "substance" of time to be homogeneous and in ratio to the number of units. Hence our prorata²⁶ allocation of value to time, lending itself to the building up of a commercial structure based on time—prorata values: time wages (time work constantly supersedes piece work), rent, credit, interest, depreciation charges, and insurance premiums. No doubt this vast system, once built, would continue to run under any sort of linguistic treatment of time; but that it should have been built at all, reaching the magnitude and particular form it has in the Western world, is a fact decidedly in consonance with the patterns of the SAE languages. Whether such a civilization as ours would be possible with widely different linguistic handling of time is a large question—in our civilization, our linguistic patterns and the fitting of our behavior to the temporal order are what they are, and they are in accord. We are of course stimulated to use calendars, clocks, and watches, and to try to measure time ever more precisely; this aids science, and science in turn, following these well-worn cultural grooves, gives back to culture an ever-growing store of applications, habits, and values, with which culture again directs science. But what lies outside this spiral? Science is beginning to find that there is something in the Cosmos that is not in accord with the concepts we have formed in mounting the spiral. It is trying to frame a NEW LANGUAGE by which to adjust itself to a wider universe.²⁷

It is clear how the emphasis on "saving

25. Whorf mentions the relationship of writing to our objectified concept of time. He argued that SAE languages lent themselves to writing because of the way SAE speakers were compelled by language to understand time. Writing was encouraged by the structure of SAE but discouraged by the structure of Hopi. A generation later scholars such as Walter J. Ong (1912–2003) and Jack Goody (1919–2015) argued the reverse: that the process of writing led to differences in understanding. In *Orality and Literacy* (1982) Ong argues that literacy transforms thought in ways possible only after the technology of writing has been adopted. Goody in particular chides Whorf for failing to see that the features of SAE are shared in common in part because they are written languages (1977: 161).

Note that Whorf's notion of society is thoroughly idealist. It is entirely determined by thinking. Most modern theorists would probably link the development of record-keeping to commerce, taxation, and the emergence of state-level society. For Whorf, it is a function of language structure.

26. "Prorata": pro rata, on a proportional basis.

27. Here Whorf suggests that language directs our scientific thinking and that scientific thinking in turn reinforces our "well-worn cultural grooves." Although Whorf here is talking about SAE-speaking society and

time" which goes with all the above and is very obvious objectification of time, leads to a high valuation of "speed," which shows itself a great deal in our behavior.

Still another behavioral effect is that the character of monotony and regularity possessed by our image of time as an evenly scaled limitless tape measure persuades us to behave as if that monotony were more true of events than it really is. That is, it helps to routinize us. We tend to select and favor whatever bears out this view, to "play up to" the routine aspects of existence. One phase of this is behavior evincing a false sense of security or an assumption that all will always go smoothly, and a lack in foreseeing and protecting ourselves against hazards. Our technique of harnessing energy does well in routine performance, and it is along routine lines that we chiefly strive to improve it—we are, for example, relatively uninterested in stopping the energy from causing accidents, fires, and explosions, which it is doing constantly and on a wide scale. Such indifference to the unexpectedness of life would be disastrous to a society as small, isolated, and precariously poised as the Hopi society is, or rather once was.

Thus our linguistically determined thought world not only collaborates with our cultural idols and ideals, but engages even our unconscious personal reactions in its patterns and gives them certain typical characters. One such character, as we have seen, is *carelessness*, as in reckless driving or throwing cigarette stubs into waste paper. Another of different sort is *gesturing* when we talk. Very many of the gestures

made by English-speaking people at least, and probably by all SAE speakers, serve to illustrate, by a movement in space, not a real spatial reference but one of the nonspatial references that our language handles by metaphors of imaginary space. That is, we are more apt to make a grasping gesture when we speak of grasping an elusive idea than when we speak of grasping a door-knob. The gesture seeks to make a metaphorical and hence somewhat unclear reference more clear. But, if a language refers to nonspatial without implying a spatial analogy, the reference is not made any clearer by gesture. The Hopi gesture very little, perhaps not at all in the sense we understand as gesture.²⁸

It would seem as if kinesthesia, or the sensing of muscular movement, though arising before language, should be made more highly conscious by linguistic use of imaginary space and metaphorical images of motion. Kinesthesia is marked in two facets of European culture: art and sport. European sculpture, an art in which Europe excels, is strongly kinesthetic, conveying great sense of the body's motions; European painting likewise. The dance in our culture expresses delight in motion rather than symbolism or ceremonial, and our music is greatly influenced by our dance forms. Our sports are strongly imbued with this element of the "poetry of motion." Hopi races and games seem to emphasize rather the virtues of endurance and sustained intensity. Hopi dancing is highly symbolic and is performed with great intensity and earnestness, but has not much movement or swing.²⁹

not the Hopi, following this reasoning implies that the Hopi could never have come up with ideas such as payment for hourly labor or either Einsteinian or Newtonian physics. Their language would have prevented them from seeing the world in the way necessary for these concepts.

At the time Whorf wrote, relativity was a fairly new concept (Whorf published this piece in 1941; Einstein published the theory of specific relativity in 1905). Whorf argues that language had not yet adapted to Einstein's discoveries.

Relativity creates an interesting problem for Whorf. If language controls thought to the degree that Whorf suggests, then how could Einstein discover concepts for which there were no words (that required a "NEW LANGUAGE")? Whorf attempts to solve this problem by proposing a feedback loop. Language creates science, which, in turn creates new vocabularies.

28. Note that Whorf makes several testable assertions in this paragraph (SAE speakers gesture more under certain conditions than under others) but does not provide data to back them.

29. It is frankly difficult to understand why Whorf makes some claims. In this paragraph, he claims that European sculpture is "kinesthetic," that it shows motion. However, even the most cursory review of European

Synesthesia
receptions of
sense, as of l
versa, should
guistic metap
spatial exper
though unde
source. Prob
arises from sy
metaphor ne
linguistic pat
experience ha
ing—for sm
nized. Nons
chiefly of the
consciousnes
and touch, a
sions. Our r
nonspatial e
putes to sou
thoughts qua
shapes, angle
experience.
transference
about tones
brilliant, slo
of some facto
tors of tone.
a gray "mon
in dress: all
European art
deliberately
tries to sugge
metric design
consciously g
rhythm; colo

art reveals tha
Gothic). The st

30. Earlier
about nonphy
suggestion tha
interesting (an
the experience
certain metaph

31. Here W
refuses to spec
that develop
conclusion of
inventions, it h

Synesthesia, or suggestion by certain sense receptions of characters belonging to another sense, as of light and color by sounds and *vice versa*, should be made more conscious by a linguistic metaphorical system that refers to nonspatial experiences by terms for spatial ones, though undoubtedly it arises from a deeper source. Probably in the first instance metaphor arises from synesthesia and not the reverse; yet metaphor need not become firmly rooted in linguistic pattern, as Hopi shows. Nonspatial experience has one well-organized sense, *hearing*—for smell and taste are but little organized. Nonspatial consciousness is a realm chiefly of thought, feeling, and *sound*. Spatial consciousness is a realm of light, color, sight, and touch, and presents shapes and dimensions. Our metaphorical system, by naming nonspatial experiences after spatial ones, imputes to sounds, smells, tastes, emotions, and thoughts qualities like the colors, luminosities, shapes, angles, textures, and motions of spatial experience. And to some extent the reverse transference occurs; for, after much talking about tones as high, low, sharp, dull, heavy, brilliant, slow, the talker finds it easy to think of some factors in spatial experience as like factors of tone. Thus we speak of “tones” of color, a gray “monotone,” a “loud” necktie, a “taste” in dress: all spatial metaphor in reverse. Now European art is distinctive in the way it seeks deliberately to play with synesthesia. Music tries to suggest scenes, color, movement, geometric design; painting and sculpture are often consciously guided by the analogies of music’s rhythm; colors are conjoined with feeling for

the analogy to concords and discords. The European theater and opera seek a synthesis of many arts. It may be that in this way our metaphorical language that is in some sense a confusion of thought is producing, through art, a result of far-reaching value—a deeper esthetic sense leading toward a more direct apprehension of underlying unity behind the phenomena so variously reported by our sense channels.³⁰

HISTORICAL IMPLICATIONS

How does such a network of language, culture, and behavior come about historically? Which was first: the language patterns or the cultural norms? In main they have grown up together, constantly influencing each other. But in this partnership the nature of the language is the factor that limits free plasticity and rigidifies channels of development in the more autocratic way. This is so because a language is a system, not just an assemblage of norms. Large systematic outlines can change to something really new only very slowly, while many other cultural innovations are made with comparative quickness. Language thus represents the mass mind; it is affected by inventions and innovations, but affected little and slowly, whereas to inventors and innovators it legislates with the decree immediate.³¹

The growth of the SAE language-culture complex dates from ancient times. Much of its metaphorical reference to the nonspatial by the

art reveals that this is true during some eras (such as the Renaissance) but false during others (such as the Gothic). The structure of SAE languages did not change between these eras.

30. Earlier in the essay Whorf pointed out that SAE speakers typically use physical metaphors to talk about nonphysical things: for example, the phrase “I take your point.” Here Whorf makes the interesting suggestion that this phenomenon developed from synesthesia. Yet if we accept Whorf’s idea, this raises an interesting (and presumably unsolvable) problem. Whorf says that linguistic metaphor perhaps arose from the experience of synesthesia, which, presumably, all humans are capable of having. If this is so, why do certain metaphors become “rooted” in one language but not others?

31. Here Whorf outlines a view of language that parallels his Boasian colleagues’ view of culture. He refuses to speculate on whether language or culture came first, saying only that they form a network of factors that developed together and influenced each other. One can also see Whorf’s linguistic determinism in the conclusion of this paragraph, where he says that while language changes slowly and is little affected by inventions, it has an immediate power over the inventors.

spatial was already fixed in the ancient tongues, and more especially in Latin. It is indeed a marked trait of Latin. If we compare, say Hebrew, we find that, while Hebrew has some allusion to not-space as space, Latin has more. Latin terms for nonspatial, like *educo*, *religio*, *principia*, *comprehendo*, are usually metaphorized physical references: lead out, tying back, etc. This is not true of all languages—it is quite untrue of Hopi. The fact that in Latin the direction of development happened to be from spatial to nonspatial (partly because of secondary stimulation to abstract thinking when the intellectually crude Romans encountered Greek culture) and that later tongues were strongly stimulated to mimic Latin, seems a likely reason for a belief, which still lingers on among linguists, that this is the natural direction of semantic change in all languages, and for the persistent notion in Western learned circles (in strong contrast to Eastern ones) that objective experience is prior to subjective. Philosophies make out a weighty case for the reverse, and certainly the direction of development is sometimes the reverse. Thus the Hopi word for “heart” can be shown to be a late formation within Hopi from a root meaning think or remember. Or consider what has happened to the word “radio” in such a sentence as “he bought a new radio,” as compared to its prior meaning “science of wireless telephony.” In the Middle Ages the patterns already formed in Latin began to interweave with the increased mechanical invention, industry, trade, and scholastic and scientific thought. The need for measurement in industry and trade, the stores and bulks of “stuffs” in various containers, the type-bodies in which various goods were handled, standardizing of measure and weight units, invention of clocks and measurement of “time,” keeping of records, accounts, chronicles, histories, growth of mathematics and the partnership of mathematics and science, all cooperated to bring our thought and language world into its present form.

In Hopi history, could we read it, we should

find a different type of language and a different set of cultural and environmental influences working together. A peaceful agricultural society isolated by geographic features and nomad enemies in a land of scanty rainfall; arid agriculture that could be made successful only by the utmost perseverance (hence the value of persistence and repetition), necessity for collaboration (hence emphasis on the psychology of teamwork and on mental factors in general), corn and rain as primary criteria of value, need of extensive *preparations* and precautions to assure crops in the poor soil and precarious climate, keen realization of dependence upon nature favoring prayer and a religious attitude toward the forces of nature, especially prayer and religion directed toward the ever-needed blessing, rain—these things interacted with Hopi linguistic patterns to mold them, to be molded again by them, and so little by little to shape the Hopi world outlook.³²

To sum up the matter, our first question asked in the beginning, p. [179] is answered thus: Concepts of “time” and “matter” are not given in substantially the same form by experience to all men but depend upon the nature of the language or languages through the use of which they have been developed. They do not depend so much upon *any one system* (e.g., tense, or nouns) within the grammar as upon the ways of analyzing and reporting experience which have become fixed in the language as integrated “fashions of speaking” and which cut across the typical grammatical classifications, so that such a “fashion” may include lexical, morphological, syntactic, and otherwise systematically diverse means coordinated in a certain frame of consistency. Our own “time” differs markedly from Hopi “duration.” It is conceived as like a space of strictly limited dimensions, or sometimes as like a motion upon such a space, and employed as an intellectual tool accordingly. Hopi “duration” seems to be inconceivable in terms of space or motion, being the mode in which life differs from form, and consciousness *in toto* from the spatial ele-

ments of consc
our own time-c
simultaneity, w
express or imp
under the Hop
placed by oper
is the physica
“stuff,” which i
tensional item
before there ca
there seems to l
there are no fo
tence may or m
also has, with or
duration, these
bottom the same

But what ab
which was also i
There is no sucl
Hopi and SAE al
probably the app
substantially the
spective of langu
Gestalt psycholo
appear to establis
cept of space will
because, as an int
linked with the c
other intellectual
and “matter,” wh
tioned. We see thi
space forms as the
has also the prop
of nonspatial relat
tendency, and as a

33. “Gestalt psyc
organized whole. Ge
the principle of proxi
Other gestalt principl

34. Whorf conclus
guage and culture. Th
Whorf intends. For ex
Hopi and that this re
fires happen because
here (and in endnote:
ture.

Most anthropologis
language has a deep i
term “Sapir-Whorf hyp
is strong or weak ling

32. Here Whorf summarizes how language and culture developed together and influenced each other to produce Western society as we know it, and how a different language and different set of cultural and environmental influences produced a very different type of culture among the Hopi. This is a classic statement of the Boasian historical view of culture.

AUTHOR'S NOTES

a. We have plenty of evidence that this is not the case. Consider only the Hopi and the Ute, with languages that on the overt morphological and lexical level are as similar as, say, English and German. The idea of "correlation" between language and culture, in the generally accepted sense of correlation, is certainly a mistaken one.

b. As we say, "ten at the same time," showing that in our language and thought we restate the fact of group perception in terms of a concept "time," the large linguistic component of which will appear in the course of this paper.

c. It is no exception to this rule of lacking a plural that a mass noun may sometimes coincide in lexeme with an individual noun that of course has a plural; e.g., "stone" (no pl.) with "a stone" (pl. "stones"). The plural form denoting varieties, e.g., "wines" is of course a different sort of thing from the true plural; it is a curious outgrowth from the SAE mass nouns, leading to still another sort of imaginary aggregates, which will have to be omitted from this paper.

d. Hopi has two words for water quantities; *ke yi* and *pa he*. The difference is something like that between "stone" and "rock" in English, *pa he* implying greater size and "wildness"; flowing water, whether or not outdoors or in nature; is *pa he*; so is "moisture." But, unlike "stone" and "rock," the difference is essential, not pertaining to a connotative margin, and the two can hardly ever be interchanged.

e. To be sure, there are a few minor differences from other nouns, in English for instance in the use of the articles.

f. "Year" and certain combinations of "year" with name of season, rarely season names alone, can occur with a locative morpheme "at," but this is exceptional. It appears like historical detritus of an earlier different patterning, or the effect of English analogy, or both.

g. The expective and reportive assertions contrast according to the "paramount relation." The expective

expresses anticipation existing *earlier* than objective fact, and coinciding with objective fact *later* than the status quo of the speaker, this status quo, including all the subsummation of the past therein, being expressed by the reportive. Our notion "future" seems to represent at once the earlier (anticipation) and the later (afterwards, what will be), as Hopi shows. This paradox may hint of how elusive the mystery of real time is, and how artificially it is expressed by a linear relation of past-present-future.

h. The Hopi verbs of preparing naturally do not correspond neatly to our "prepare"; so that *na'twani* could also be rendered "the practiced-upon," "the tried-for," and otherwise.

i. See, e.g., Ernest Beaglehole, *Notes on Hopi Economic Life* (Yale University Publications in Anthropology, no. 15, 1937), especially the reference to the announcement of a rabbit hunt, and on p. 30, description of the activities in connection with the cleaning of Tor-e-va Spring—announcing, various preparing activities, and finally, preparing the continuity of the good results already obtained and the continued flow of the spring.

j. This notion of storing up power, which seems implied by much Hopi behavior, has an analog in physics: acceleration. It might be said that the linguistic background of Hopi thought equips it to recognize naturally that force manifests not as motion or velocity, but as cumulation or acceleration. Our linguistic background tends to hinder in us this same recognition, for having legitimately conceived force to be that which produces change, we then think of change by our linguistic metaphorical analog, motion, instead of by a pure motionless changingness concept, i.e. accumulation or acceleration. Hence it comes to our naive feeling as a shock to find from physical experiments that it is not possible to define force by motion, that motion and speed, as also "being at rest," are wholly relative, and that force can be measured only by acceleration.

k. Here belong "Newtonian" and "Euclidean" space, etc.

Important work in this area includes Brent Berlin and Paul Kay's work (1969) on the universality of color terms, John Lucy's work (2004) on Yucatec Maya, and Michael Silverstein's work (1993) on metalinguistic awareness. Many others reject any form of linguistic determinism, such as the linguist John McWhorter (2014), who published a polemical attack on the idea that there is any connection between language and culture at all.

It is also worth noting that Whorf's knowledge and understanding of Hopi have been questioned. In 1983, Ekkehart Malotki argued that Whorf simply got it wrong and that claims that Hopi do not use expressions such as "ten days" are incorrect. Malotki argued that the Hopi conception of time was not radically different from our own (1983: 529–30).

In the end, the degree to which Sapir and Whorf believed that language determined thought and culture remains unclear. However, the idea that there is a relationship between language, thought, and behavior seems intuitively obvious and retains a strong presence in some branches of anthropological thinking.

Function

In the first thirty clearly the dominarily abandoned with the same divided into two us here.

In the 1880s (1855–1940) em influenced by E. (1820–1903). In dissatisfied with Australia, in the 21).

Haddon went including *Notes a Lands*. This was a tion of use to anth but Tylor was the Haddon collected to anthropology.

Back in Englair in physical anthrc soon became com study of native bo interdisciplinary t experimental psyc William McDoug linguist S. H. Ray team arrived in the but all left within

Despite its rela ment of both anth important profess bridge, Seligman at Cambridge but McDougall taught

When Haddon their research and next generation of (1884–1942), A. 1980), Winifred H riences, they mad worked by summo students to learn l Haddon and his