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A Proposed Solution to The Linguistic Relativity (Sapir–Whorf) Hypothesis

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ABSTRACT

The question of whether human language plays a constitutive role in shaping human thought, or merely dresses up pre-formed thoughts—thus occupying a secondary role in the constitution of thought—has occupied scientists and philosophers of language and mind for centuries. The present paper undertakes a philosophical investigation of the Sapir–Whorf hypothesis and seeks to dispel certain confusions surrounding it. It is demonstrated that human language is both an inseparable component of human psychology (a cognitive mechanism) and an indispensable part of the social practices in which humans participate (a social tool, a technology that each culture uses creatively). The distinction between language as a cognitive–semiotic system and as a culture specific-national constituent is crucial when we investigate linguistic relativity. Ultimately, language coordinates, influences, and directs thought and psychological processes; it also constitutes and reproduces culture, helping it to evolve.

Keywords: Linguistic Relativity, Sapir – Whorf Hypothesis, Linguistic Anthropology, Philosophy of Language, Philosophy of Mind

INTRODUCTION

The hypothesis of linguistic relativity (Sapir–Whorf hypothesis) and its two versions

The Sapir–Whorf hypothesis emerged in the first half of the 20th century, articulated by linguists Edward Sapir (1929) and Benjamin Lee Whorf (1940). Although never explicitly presented in a joint publication, passages from their respective works form the basis of this hypothesis, which exists in two versions: a strong and a weak one.

The strong version (the *strong Sapir–Whorf Hypothesis*, or linguistic determinism) asserts that each human language completely determines how its speakers understand the world. Linguistic categories—such as grammatical gender, tense, aspect, or lexical distinctions for numbers or colors—are said to restrict speakers' cognitive categories, thereby constraining their perception and understanding of reality.

The weak version (the *weak Sapir–Whorf Hypothesis*, or weak linguistic relativity) maintains instead that each language merely influences, to some degree, the understanding of reality by its speakers, without absolutely binding or determining it.

While the strong version has largely lost credibility among scholars, the weak version is widely accepted by contemporary linguists and cognitive scientists (Pinker, 1994; Kay & Kempton, 1984; Ahearn, 2021). This raises a crucial question: how are human language and human thought connected—first within the framework of human psychology, and then within the cultural context in which all human activity unfolds?

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Language and Thought

Language and thought in the context of human psychology

Human language and human thought are intimately connected, a fact recognized since antiquity. Ancient Greeks used the term *logos* to denote both speech and reason, while Plato, in his dialogue *Cratylus*, raises fundamental questions about the relationship between language and reality (Dalimier, 1998). But what is the architecture of the human psychology, and where exactly do thought and language fit within it?

Human psychology is a complex whole, composed of cognitive abilities, psychological states, psychological behaviors and emotions, semiotic codes, and, underlying it all, a largely subconscious moral and value system. Human thought, as a cognitive creation arising from human psychology, consists of the combined operation of cognitive abilities, psychological states, emotions – psychological behaviors and semiotic codes.

It is fundamentally structured and directed through human language. The latter is understood as the primary convention underlying and coordinating all other conventions and behaviors (Searle, 1995, 2010). In the table below (Table 1), the components of human psychology are showcased to the readers:

Human Psychology Components	
Cognitive Abilities (Nature; Biological construction of human being)	Perception, Observation, Memory, Directedness, Pattern Recognition, Aesthetic Judgment, Categorization
Psychological States (Interaction of Nature and Nurture)	Beliefs, Desires, Intentions, Logics, Mindsets, Narratives–Myths, Ideologies, Prejudices
Foundation – Background **Morality – Value** System	
Emotions – Psychological Behaviors (Naturally developing; Distribution influenced by activities, hormones, age, sex, etc.)	Joy, Enthusiasm, Anxiety, Sadness, Fear, Anger, Irritation, Stress, Motivation, Satisfaction, Gratitude, Impatience, Boredom/Perseverance, Patience, Discipline, Interest, Indifference
Semiotic Codes – Cognitive Systems (Acquired in human societies, further cultivated through practice)	Numbers, Language, Images, Music

Table 1: Architecture of human psychology (Pinker, 1994, 2007; Lakoff, 2014)

Thought evolved from imagistic to indexical and then to symbolic, following Charles Sanders Peirce's tripartite semiotic classification (Deacon, 1997). Linguistic representation builds upon prior mental representations, and linguistic semantics derives from the logical connections within thought, as a "representation of representations." Thought is analogical, holistic, and continuous, providing a primary representation of experiential data; language, by contrast, is digital, discrete, and segmented (into words). Language is composed of arbitrary symbols, products of abstraction and generalization, which can be used independently of spatiotemporal constraints (*displacement*), can refer to themselves (*metalinguistic function*), and can be combined in infinite ways to generate new thoughts—digital thoughts subsequently applied to the physical world (Christidis, 2002).

The way in which individuals employ their cognitive abilities, emotions, psychological states, and semiotic codes determines their distinctive idiosyncrasy, linking or differentiating them from others.

Correlation, but non-exhaustion, of human thought in language

While human thought is related to and expressed by language, it is not exhausted in language, for several reasons (also see the relevant discussion in Pinker, 1994):

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(a) The formation of thought in response to environmental stimuli (external or internal) engages the full range of cognitive abilities—perception, attention, pattern recognition, memory (procedural and episodic), sensory–motor systems—not solely language.

(b) There are modes of thought, in which language plays little or no role (e.g., visual thinking, mathematical thinking, musical thinking, the kinesthetic thought of an athlete in motion), or in which it operates peripherally and secondarily. Acquiring such modes of thought requires immersion in the practices of those who already possess them. Professional activities shape cognition by prioritizing certain forms of thought over others.

(c) Infants, as well as nonhuman animals (e.g., dogs, cats, bees), are capable of thought without having developed or using language as a communicative system.

(d) The same ideas, arising from worldly experience or scientific inquiry (e.g., special and general relativity, quantum mechanics), can be expressed in different languages or translated between them without substantial loss.

(e) If thought and language were identical, metalinguistic reflection would be impossible—we could not think *about* language using a specialized metalinguistic vocabulary.

Nonetheless, language remains central to human psychology because it:

(a) Expresses, directs, and generates thoughts—some of which could not exist without it—and at the same time interacts continuously with all other cognitive faculties. It is infinitely expressive (given sufficient effort through metaphor and explanation) and explanatory (everything can be explained in hindsight through language). It enables the creation, maintenance, and participation in human intersubjective realities.

(b) Serves as a social convention at the core of all other social conventions (political, educational, athletic, artistic, military). Declarative speech acts represent as existent that which is not yet actual, fostering imagination, narrative thinking, and action beyond immediate needs (Searle, 1995, 2010).

(c) Encodes stances toward reality, with precision enabled by stylistic choices (familiar–formal, composed–impulsive), framing reality through conceptual schemas, facilitating coordinated action and cooperation.

(d) Works in continuous interplay with the body and mind to categorize, organize, and represent reality via grammatical categories (nouns, verbs, adverbs, prepositions) (Pinker, 2007).

(e) Supports other semiotic systems such as mathematics (expressing quantity, arithmetic operations) and music (evaluating aesthetic decisions, guiding composition, aiding presentation).

(f) Enables self-communication: internalized yet externalizable, language allows silent thinking. “Talking to oneself” brings memories, feelings, and ideas to the forefront of consciousness. Humans are always in a latent social state, using an inherently intersubjective semiotic code (there is no private language in Wittgenstein’s sense).

(g) Grants access to any domain of knowledge. Cultivating language—through reading, writing, and discourse—enhances overall thought and cognitive capacity.

(h) Once an object, person, or situation is named, new thoughts about it become possible. You can comment on it, praise it or reject it. Without language, complex social thought as we know it, becomes impossible.

Language and thought in the context of human culture

Language acquisition occurs within, and is shaped by, human culture. Language is both ontologically objective (a biological trait common to all humans) and ontologically subjective (varying in mastery and use among individuals). It is, in reality, an intersubjective convention—both material (signifiers in concrete situations) and semantic - immaterial (signifieds in the minds of individuals). Social realities are linguistically mediated and

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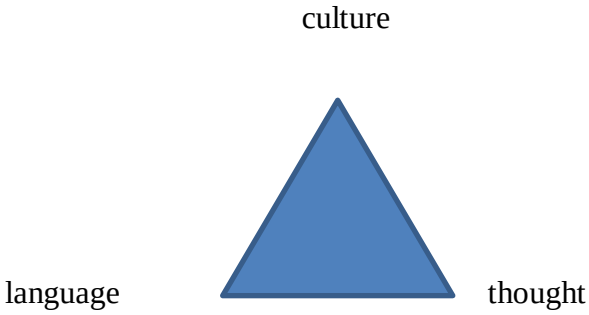
progress through discourse. Each human domain (athletic, artistic, military, scientific, enterprising, religious) has its own communicative code, which constitutes the stylistic hallmark of that domain's practitioners.

Languages encode reality to varying degrees of detail depending on the needs of their communities. For example, the language of an Amazonian tribe (e.g., Pirahã, Munduruku) lacks the extensive numerical vocabulary of a Western European language because its speakers have no need for it in their simpler, non-commercial daily life. Thus, each language encodes and expresses reality differently, but all languages have equal possible expressive abilities. Research of recent decades (Berlin & Kay, 1969; Slobin, 1996; Boroditsky, 2001; Levinson, 2003; Everett, 2008; Deutscher, 2010; Fausey & Boroditsky, 2010) has shown both universal similarities and language–culture-specific differences in the conceptualization of space, time, number, and color (see 1.2.4 section for an in depth overview). All languages are structurally and functionally equal, serving the needs of their speakers within their respective cultural contexts. Language, thought, and culture mutually shape one another, forming a triangle (Ahearn, 2021):



Finally, a sociolinguistic reformulation of the Sapir–Whorf hypothesis, proposed by Stubbs (1997), transforms it from a cross-linguistic to an intra-linguistic framework: different linguistic choices within the same language activate different conceptual frames, thereby influencing perception and framing of reality. For example, choosing the word *refugee* rather than *illegal immigrant* frames the same phenomenon in markedly different ways. Intra-linguistic choice in this case affects human thinking and understanding of reality to a great extent.

Empirical studies on Language, Thought and Culture

A large body of empirical research demonstrates that thought, language and culture are closely related, without either being reducible to the other.

Space and Time

Lera Boroditsky (2010) studied an Aboriginal community that speaks Kuuk Thaayorre and lives in Pormpuraaw, Australia. Her findings showed that these speakers conceptualize time differently from English speakers because they conceptualize space differently. The Kuuk Thaayorre language does not contain words such as *left*, *right*, or *in front of*, as its speakers do not represent space relative to their bodies. Instead, all spatial relations are expressed using the cardinal directions (North, South, East, West). For example, instead of saying "place the glass to your left," speakers say "place the glass to the North."

Members of this community always know with great accuracy where North, South, East, and West are located. With respect to temporal cognition, English speakers tend to place earlier events on the left and later events on the right, largely due to the left-to-right direction of writing. Kuuk Thaayorre speakers, however, organize time from East to West. Earlier events are located in the East and later events in the West; time flows from East to West. When speakers face East, time moves toward them; when they face West, time moves away from them. When facing North, time unfolds from right to left, and when facing South, from left to right (using English spatial terms). For these Aboriginal speakers, time is not anchored to the body, but to the surrounding landscape.

Notably, significant differences also emerge among egocentric languages. For example, Greek speakers say *the meeting lasted a lot of time* or *a lot of time has passed*, whereas English speakers say *it was a long meeting* or *it's been a long time*. Greek uses terms of quantity to describe duration, while English uses terms of length. The

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question arises whether this linguistic difference corresponds to different ways of perceiving temporal duration. Daniel Casasanto and colleagues (2004) found precisely this through a series of experiments with Greek and English speakers.

In the first experiment, participants were shown lines extending across a computer screen, one at a time. They were then asked to reproduce, using two successive mouse clicks, either the duration of the line's extension (how long it took to extend) or its spatial displacement (length). The researchers' primary interest was the estimation of duration. They found that when English speakers estimated duration, they were significantly influenced by the length of the line. Greek speakers, by contrast, were not substantially influenced by line length when estimating duration.

In the second experiment, participants were shown virtual containers filling with water, again one at a time. They were then asked to reproduce either the quantity of water in the container or the duration for which it remained on the screen. Greek speakers were significantly influenced by the quantity of water when estimating duration, whereas English speakers were not.

Such experiments provide evidence for genuine differences in thought rather than merely in language. This is demonstrated by the fact that the tasks contain no linguistic stimuli and do not require participants to produce language. Instead, participants are exposed to non-linguistic stimuli (lines extending on a screen, containers filling with water) and respond solely through mouse clicks, relying entirely on cognitive processing. In this case, linguistic differences reflect differences in thought.

Thus, Greeks not only talk about but also, to some extent, conceptualize duration in terms of quantity, whereas English speakers conceptualize it in terms of length.

Perhaps most striking is that differences can be observed even between different historical stages of the same language. For modern Greek speakers, the future lies ahead and the past behind. Expressions such as *I move forward* refer to the future, while *I do not go backwards* refers to the past. This was not always the case. For Ancient Greeks, the past was in front of them, because it had already occurred and was visible, whereas the unknown future lay behind them. In Ancient Greek, the word *opisō* ("behind") could be used to refer to the future.

Numbers

There exists a language whose number words stop at five. Indeed, such a language exists: Munduruku, spoken by the Munduruku people who live along the Amazon River in Brazil. This language has words for one (*pug*), two (*xep xep*), three (*ebapug*), four (*edadipdip*), and five (*pug pogbi*). An interesting fact is that from one to four, the number of syllables in each word corresponds to the number itself.

The linguist Pierre Pica (2004) studied the Munduruku for many years while living among them in the Amazon. He sought to examine whether and how accurately they could perform numerical calculations. Experiments conducted by Pica and his colleagues showed that the Munduruku can perform exact calculations with numbers below five and approximate calculations for numbers above five. They were unable to perform any exact calculation involving numbers greater than five and could not even determine the result of six minus four. Thus, the absence of number words beyond five affects the precision with which they can perform numerical calculations.

Color, Gender, and Grammar

Beyond numbers, researchers have also focused on color. Languages differ considerably in the number of color terms they possess. For example, English and Greek both have separate words for blue and green. In contrast, Tarahumara, a language spoken by the Tarahumara people of Mexico, has only one word, *siyóname*, which refers to both blue and green.

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In a well-known experiment, Paul Kay and Willett Kempton (1984) found that native English speakers perceive the distinction between blue and green more categorically than Tarahumara speakers, emphasizing the boundary between the two colors. This difference in perception is attributed to the English language, which lexicalizes the distinction.

In a more recent experiment, Jonathan Winawer and colleagues (2007) found that native Russian speakers detect differences between light and dark blue more quickly than English speakers. Russian, like Greek, has two distinct words for these shades: *goluboy* (light blue) and *siniy* (dark blue). English, by contrast, uses a single term, *blue*, for the entire spectrum.

Another area of interest is grammatical gender. Grammatical gender (masculine, feminine, neuter) does not necessarily correspond to biological sex. For example, in Greek, *the boy* and *the girl* are both grammatically neuter, despite differing in biological sex. Moreover, the number of grammatical genders varies across languages: French and Spanish, for instance, lack a neuter gender.

The grammatical gender assigned to the same object can also differ across languages, as illustrated by the following examples:

- *der Tisch* (masculine in German), *la table* (feminine in French), *to trapezi* (neuter in Greek)
- *le feu* (masculine in French), *i fotia* (feminine in Greek), *das Feuer* (neuter in German)
- *o kosmos* (masculine in Greek), *el mundo* (masculine in Spanish), but *die Welt* (neuter in German)

Boroditsky, Schmidt, and Phillips (2003) found that grammatical gender can influence how speakers perceive the objects denoted by words. For example, the grammatical gender of the words *key* and *bridge* in German and Spanish affects the adjectives speakers use to describe them. *Key* is masculine in German (*der Schlüssel*) and feminine in Spanish (*la clave*). German speakers describe keys as hard, heavy, metallic, and jagged, whereas Spanish speakers describe them as golden, complex, small, lovely, and shiny. Conversely, *bridge* is feminine in German (*die Brücke*) and masculine in Spanish (*el puente*). German speakers describe bridges as beautiful, elegant, fragile, and slender, while Spanish speakers describe them as large, dangerous, long, strong, powerful, and tall. The researchers suggest that grammatical gender may even influence the design of objects and structures such as bridges.

Syntax

Finally, syntactic structure provides further evidence for linguistic relativity. The preferred syntactic patterns of a language guide speakers' attention to different aspects of events. If a woman accidentally breaks a vase, English speakers are more likely to say:

"She broke the vase,"

whereas Spanish speakers are more likely to say:

"Se rompió el florero" ("The vase broke").

English emphasizes the agent, while Spanish emphasizes the event itself when describing an accident. Caitlin Fausey and Lera Boroditsky (2010) designed an experiment that demonstrated this effect. They showed sixteen videos depicting intentional actions and accidents to English and Spanish speakers. For example, in one video a man deliberately popped a balloon; in another, he popped it accidentally. In a further example, a man intentionally dropped his keys, or dropped them accidentally while trying to place them on a table. Participants were then asked to describe what happened.

While both English and Spanish speakers emphasized the agent equally when describing intentional actions, English speakers focused more on the agent when describing accidents, whereas Spanish speakers focused more

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on the event itself. This difference may have significant implications for eyewitness testimony, as syntactic preferences appear to influence how events are described and, consequently, how responsibility and punishment may be assigned.

In all the above cases, speakers are not incapable of thinking about or perceiving concepts such as space, time, quantity, objects, or events. Nevertheless, the language they speak influences how these concepts are understood by directing attention to different aspects of experience.

MATERIALS AND METHODS

The present study utilizes previous studies on linguistic relativity and evaluates their findings. After a thorough investigation of the relationship between language and thought in the context of human psychology, the focus shifts to the relationship between language and thought in the context of human culture and the Sapir – Whorf linguistic relativity problem is being reformulated accordingly. To solve the question of how language affects thought, a distinction is necessary, which is discussed in Results (3). The studies utilized can be found in the Bibliography section (5).

The analytical framework of the study draws inspiration from the analytic tradition in the philosophy of language and mind (Wittgenstein, Austin, Searle), while simultaneously taking into account questions and findings from empirical research in cognitive linguistics (Evans, 2019), linguistic neuroscience (Lakoff, 2014), and the anthropology of language (Everett, 2017). In this way, it seeks to offer a multidimensional approach to the Sapir–Whorf hypothesis, aiming to bridge the divide between thinkers and researchers who conceive of language either exclusively as a subjective cognitive mechanism—such as generativists—or exclusively as a social tool embedded within particular cultural contexts—such as functionalists. Both are true when they are combined and neither is true on its own, as we will see below.

The sources considered constitute some of the most up-to-date and authoritative contributions to this significant philosophical problem. References were selected from different fields and traditions within linguistics in order to provide an analysis that is as multifaceted as possible, while remaining rigorously grounded in contemporary scientific research and philosophical thought.

RESULTS

Reformulating the hypothesis (the actual Sapir–Whorf question and its resolution)

Taking into account the above discussion, we can now reformulate the Sapir–Whorf question as follows:

Does human language play a constitutive role in shaping human thought, or does it merely dress up already pre-formed thoughts—thus playing a secondary role in the constitution of thought?

For centuries, scientists, philosophers of language and mind, and everyday speakers have disagreed over this question—some arguing that language is a constitutive element of thought, others that it merely dresses up pre-formed ideas. Can a clear answer be given?

A proposed solution to the Sapir–Whorf hypothesis

As it is often the case in philosophy, both positions contain a grain of truth: language both participates in the formation of human thought and dresses it up in the garment of a given culture.

The key lies in distinguishing between *human language* as a cognitive system of the human mind and the *particular national language* of a given community - nation:

Human language, as a highly powerful cognitive–semiotic system unique to our species, participates in structuring and constituting thought in ways impossible without it.

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A given national language, In turn, dresses up thoughts—already formed at an initial stage—in the attire of its culture.

In this framework, the "language of thought" (Pinker's *Mentalese*, 1994) correlates to language as a cognitive system–together with the other cognitive abilities of the human mind that participate in the creation of human thoughts-, while each national language corresponds to the cultural garment in which human thoughts are dressed, at the time they are finally expressed.

DISCUSSION

With that distinction in mind, the linguistic relativity hypothesis begins to resolve. Language as a cognitive system contributes to the constitution of human thoughts and as a cultural tool with national significance gives our thoughts a culture specific flair. Different linguistic choices can influence thought within the broader context of human psychology. However, thought is by no means imprisoned by language:

"Learning a language means immersion in a tradition composed not of empty words and phrases, but of words and phrases whose meaning is inextricably bound up with the total tradition and life of a culture and society." (De Mauro, 2019)

The distinction between language as a cognitive system and national language is one that cannot be omitted when we talk about linguistic relativity, and that is something that the present essay aspires to make clear to future research works in the field. With this distinction in mind, cognitive linguists, anthropologists and philosophers of language and mind can begin to see more clearly the Sapir–Whorf hypothesis and pose relevant research questions in the fields of the interrelation of language, thought, and culture.

The fact that we speak a language means that we have access to an incredibly rich semiotic system that changes the way our brain works and processes reality -specifically, social human realities.

The fact that we speak one or more national languages means that we can dress up the same thoughts in different ways, appealing to different cultures, relevant to the languages that we speak.

Also, it is important to note that language is not merely a communication tool. As we saw above language coordinates and directs human thoughts, activates frames of interpretation, brings back memories, makes actions and emotions understandable to others and creates thoughts about concepts that would not be possible without it. In other ways, it organizes human thought and action in completely new ways, which are not available to other representatives of the animal kingdom that do not have it, despite the fact that they communicate in other various ways -e.g. shouts, gestures, etc.- (Deacon, 1997). Modern social realities wouldn't exist without language. And systematic complex thoughts, in the way we experience them today, also couldn't form without it.

CONCLUSIONS

In summary, human language, as a cognitive system specific to humans, plays a constitutive role in the formation of human thoughts, whereas a given national language dresses up those thoughts—already initially formed—in the attire of its related culture. Human language is both an inseparable part of human psychology (a cognitive mechanism) and of the social practices in which humans participate (a social tool, a technology) within a culture. Ultimately, language both coordinates, influences, and directs our thought and psychology, constituting, reproducing, and evolving at the same time our culture.

Only the moderate—weak version of the Sapir–Whorf hypothesis retains validity in light of this investigation; the strong version must be rejected as false. Human thought is not exhausted in human language, although language pulls its strings. Thought is shaped by human biology–physiology—of which language is a part as a cognitive system interacting with the rest—and by cultural expectations (modes of reaction, collective goals, national myths, cultural achievements) characteristic of a given culture and transmitted through the national language or languages that are used within it.

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