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What Is the Relationship Between Language and Thought?: Linguistic Relativity and Its Implications for Copyright

Christopher S. Yoo*

ABSTRACT

To date, copyright scholarship has almost completely overlooked the linguistics and cognitive psychology literature exploring the connection between language and thought. An exploration of the two major strains of this literature, known as universal grammar (associated with Noam Chomsky) and linguistic relativity (centered around the Sapir-Whorf hypothesis), offers insights into the copyrightability of constructed languages and of the type of software packages at issue in *Google v. Oracle* recently decided by the Supreme Court. It turns to modularity theory as the key idea unifying the analysis of both languages and software in ways that suggest that the information filtering associated with the Sapir-Whorf hypothesis may be a general strategy for managing complex systems that is not restricted to language. It also examines Jerry Fodor's application of modularity theory to cognition and his Language of Thought Hypothesis to see what they reveal about the idea-expression dichotomy.

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INTRODUCTION

What is the connection between language and thought? Much of copyright depends on the answer to that question being “not much.” For example, copyright has long distinguished by the ideas being expressed and the words used to express them, with legal protection being reserved exclusively for the latter.¹ The Court relied on this dichotomy when rejecting arguments that copyright violates the First Amendment, concluding that giving authors exclusive control over certain expression does not prevent others from articulating the same ideas using different words.² Limits to the dichotomy also underlie the “merger doctrine,” which denies copyright protection when there is only one way to express an idea way for the simple reason that exclusive control over the expression would be tantamount to control over the idea itself.³

Despite the foundational character of these principles, the Supreme Court’s landmark decision in *Google LLC v. Oracle America, Inc.*,⁴ offered hints of ways that language and thought may enjoy a deeper connection than is generally recognized. In holding that Google’s use of the Application Programming Interfaces (APIs) created for Java by Oracle’s predecessor,

¹ For the seminal statement, see *Mazer v. Stein*, 347 U.S. 201, 217 (1954). For further statements, see *Google LLC v. Oracle Am., Inc.*, 141 S. Ct. 1183, 1196 (2021); *Golan v. Holder*, 565 U.S. 302, 328 (2012); *Eldred v. Ashcroft*, 537 U.S. 186, 219 (2003); *Feist Public’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 350 (1991); *Harper & Row, Publ’rs, Inc. v. Nation Enters.*, 471 U.S. 539, 556 (1985).

² See *Harper & Row*, 471 U.S. at 558 (holding that the “idea/expression dichotomy strike[s] a definitional balance between the First Amendment and the Copyright Act by permitting free communication of facts while still protecting an author's expression”); *Eldred*, 537 U.S. at 219 (holding that the idea-expression dichotomy constituted one of two “built-in First Amendment accommodations” included in copyright, quoting *Harper & Row*).

³ Although the doctrine is typically viewed as originating in *Baker v. Selden*, 101 U.S. 99 (1879), Pamela Samuelson’s careful review of the doctrinal history concludes that it actually originated in *Apple Computer, Inc. v. Franklin Computer Corp.*, 545 F. Supp. 812, 823 (E.D. Pa. 1982), *rev’d*, 714 F.2d 1240, 1253 (3d Cir. 1983). See Pamela Samuelson, *Reconceptualizing Copyright’s Merger Doctrine*, 63 J. COPYRIGHT SOC’Y U.S.A. 417, 419–25 (2016).

⁴ 141 S. Ct. 1183 (2021).

Sun Microsystems, constituted fair use, it recognized that APIs play a critical organizing function that arranges and groups tasks in a particular way.⁵ The Court supported this observation with a “rough analogy” to the way spoken languages “divides into sets of concepts a world that in certain respects other languages might have divided differently.”⁶

Although the opinion cited no authority as support for this analogy, the Court’s observation tied into a long-running debate in the fields of linguistics and cognitive psychology over the extent to which thought and language are independent of one another. The linguistic relativity school, animated by the concept known as the Sapir-Whorf hypothesis, asserts that people think in terms of specific languages and that the native language that a person speaks shapes the way that person perceives the world.⁷ Such claims also resonate with claims that some concepts cannot be translated into other languages and that thinking in another language often involves a different mode of thought, the inherent sexism of using of “he” as the dominant indefinite pronoun,⁸ and the frequent observation that training in the language of the law teaches students to “think like a lawyer.”⁹ It also appears prominently in fiction, with the most familiar example likely being George Orwell’s *1984*, in which the government created a language called “Newspeak” based on the premise its structure would prevent people from thinking certain thoughts.¹⁰ Other prominent examples exist as well.¹¹

⁵ *Id.* at 1192.

⁶ *Id.*

⁷ The term was coined by a student of Edward Sapir. See Harry Hoijer, *The Sapir-Whorf Hypothesis*, in LANGUAGE IN CULTURE: CONFERENCE ON THE INTERRELATIONS OF LANGUAGE AND OTHER ASPECTS OF CULTURE 92 (Harry Hoijer ed., 1954).

⁸ See Jane H. Hill & Bruce Mannheim, *Language and World View*, 21 ANN. REV. ANTHROPOLOGY 381, 387–90 (1992) (providing a survey of early research on this topic).

⁹ See ELIZABETH MERTZ, THE LANGUAGE OF LAW SCHOOL: LEARNING TO “THINK LIKE A LAWYER” 17–18, 28 (2007) (providing an argument based on the Sapir-Whorf hypothesis that teaching law students to use certain language shapes their perceptions and influences their orientations).

¹⁰ *Appendix: The Principles of Newspeak*, in GEORGE ORWELL, 1984, at 303 (1949).

Other scholars have sharply contested the Sapir-Whorf hypothesis. Most notably, Noam Chomsky's theory of universal grammar downplays the impact of context and instead contends that genetics and biology lead all speech to follow a set of uniform syntactic rules.¹² The controversy has ebbed and flowed over the years, with different sides holding preeminence at different times.¹³ At this point, the last word seems far from being said.

Despite the key role that the putative independence between language and thought plays in key copyright doctrines, copyright scholars have paid virtually no attention to these important lines of research, and an extended discussion analysis of its insights and limitations has yet to appear in the legal academic literature.¹⁴ No article have explored its implications for foundational concepts such as the idea-expression dichotomy, the related merger doctrine, and the exclusion of the functional aspects of works.

This Article seeks to fill this void by exploring these competing schools of thought and their importance for copyright law. Part I lays out the debate between linguistic relativity and universal grammar. Given the Sapir-Whorf hypothesis's emphasis on how language structures

¹¹ For example, Robert Heinlein describes "Speedtalk," a language in which the faster communication made possible by the compression of words into single syllables promotes superintelligence. Robert Heinlein, *Gulf*, ASTOUNDING FICTION, Nov. 1949, at __. He also refers to the engineered language, Loglan, in ROBERT HEINLEIN, *THE MOON IS HARSH MISTRESS* 13, 17, 19, 381 (1966). On a lighter note, the character, Amy Farah Fowler, in the popular television series, *The Big Bang Theory*, twice refers to languages she has constructed. *The Big Bang Theory: The Skank Reflex Analysis* (CBS television broadcast Sept. 22, 2011); *The Big Bang Theory: The Deception Verification* (CBS television broadcast Sept. 26, 2013).

¹² See, e.g., NOAM CHOMSKY, *SYNTACTIC STRUCTURES* xii (1957).

¹³ See, e.g., Joshua Hartshorne, *Does Language Shape What We Think?*, SCI. AM. MIND (Aug. 18, 2009), <https://www.scientificamerican.com/article/does-language-shape-what/>.

¹⁴ The only discussion of the Sapir-Whorf hypothesis of any note appearing in the copyright literature appears to be a two-page passage in Fred Koenigsberg's Meyer Lecture. I. Fred Koenigsberg, *Humpty Dumpty in Copyrightland*, 51 J. COPYRIGHT SOC'Y U.S.A. 677, 678–80 (2004). A student note on constructed languages mentions linguistic relativity when describing the origins of Loglan without analyzing it in any depth. Michael Adelman, Note, *Constructed Languages and Copyright: A Brief History and Proposal for Divorce*, 27 HARV. J.L. & TECH. 544, 548 (2014). Michael Madison has alluded to the concept in footnotes. See Michael J. Madison, *A Pattern-Oriented Approach to Fair Use*, 45 WM. & MARY L. REV. 1525, 1631 n.469 (2004); Michael J. Madison, *Rights of Access and the Shape of the Internet*, 44 B.C. L. REV. 433, 439 n.25 (2003).

affect thought, the next two Parts discuss the implications of this debate for the copyrightability of different types of languages: Part II considers the colorful world of constructed languages, such as Tolkien’s elvish and Esperanto, analyzing how different types are animated by different goals and discussing the role of copyright in furthering those goals. Part III addresses the application of copyright to software, paying particular attention to the “rough analogy” between software and natural languages drawn by the Supreme Court in *Google LLC v. Oracle America, Inc.*¹⁵ It uses modularity theory as the key idea unifying the analysis of both languages and software in ways that suggest that the information filtering functions associated with the Sapir-Whorf hypothesis may be a general strategy for managing complex systems that has importance far beyond language. It also briefly examines Jerry Fodor’s application of modularity theory to cognition to see what it reveals about the idea-expression dichotomy.

A better understanding of these cutting-edge debates in linguistics and cognitive psychology promises to provide new insights into key aspects of copyright law. I hope that it also provides a contribution to the emerging field of law and linguistics.¹⁶

I. EXPLORING RELATIONSHIP BETWEEN LANGUAGE AND THOUGHT

The debate over the relationship between language and thought has lasted for over a century. Part A traces the early 20th century rise of what has become known as the Sapir-Whorf hypothesis, which contends that the grammatical structure of a person’s native language influences the way people perceive the world. Part B discusses the emergence of universal grammar during the 1960s and its implication that all languages embody the same structure,

¹⁵ 141. S. Ct. 1183, 1192 (2021).

¹⁶ See *Northwestern University/Washington University Law and Linguistics Conference*, 73 WASH. U. L.Q. 769 (1995); *The Syntax of Justice Conference*, NORTHEASTERN UNIV. (Apr 13, 2017), <https://cos.northeastern.edu/news/syntax-justice-conference/>.

which in turn suggests that language structures cannot have a differential impact on the way people think. Part C examines the revival of interest in the Sapir-Whorf hypothesis that began in the 1990s, which shifted focus away from the impact of a language's grammatical structure and towards the context in which particular language is used.

A. The Sapir-Whorf Hypothesis and Linguistic Relativity

Although discussions of linguistic relativity are generally framed in terms of the “Sapir-Whorf Hypothesis,” the appellation is widely regarded as something of a misnomer.¹⁷ In the words of Hill and Mannheim, “just as the Holy Roman Empire was neither holy, nor Roman, nor an empire, the ‘Sapir-Whorf Hypothesis’ is neither consistent with the writings of Sapir and Whorf, nor a hypothesis.”¹⁸

Although theories about the connection between language and thought has other historical antecedents,¹⁹ Frank Boas, who is widely recognized the founder of anthropology in the U.S., is generally credited for introducing it into the modern debate. Boas broke with the

¹⁷ See, e.g., Caleb Everett, *Evidence for Language-mediated Thought in the Perception of Non-gendered Figures*, 52 TEX. LINGUISTIC F. 24, 24 (2008); He Jing, *The Validity of Sapir-Whorf Hypothesis—Rethinking the Relationship Among Language, Thought and Culture*, 9 US-CHINA FOREIGN LANGUAGE 560, 561 (2011); Maia Kutateladze, *Language Definition and Its Relation to Culture*, PROC. 6TH INT’L CONF. ON AM. STUD. 10, 14 (2008); available at https://eduhum.ibsu.edu.ge/old/files/Menu%20Items/6th_International_Conference_on_American_Studies.pdf; Bruce I. Kodish, *What We Do with Language – What It Does with Us*, 60 ETC: REV. GEN. SEMANTICS 383, 384 (2003–2004).

¹⁸ Hill & Mannheim, *supra* note 8, at 386.

¹⁹ The theory has roots in the 19th-century writings of Vico and Wilhelm von Humboldt. For overviews of the historical roots, see DELL H. HYMES, *ESSAYS IN THE HISTORY OF LINGUISTIC ANTHROPOLOGY* (1983); J.P. PENN, *LINGUISTIC RELATIVITY VERSUS INNATE IDEAS: THE ORIGINS OF THE SAPIR-WHORF HYPOTHESIS IN GERMAN THOUGHT* (1972); Danny K.H. Alford, *Benjamin Whorf Revisited, Part I: Demise of the Whorf Hypothesis*, 4 PHOENIX: NEW DIRECTIONS STUD. MAN 84, 94–96 (1980); Ranjit Chatterjee, *Reading Whorf Through Wittgenstein: A Solution to the Linguistic Relativity Problem*, 93 LINGUA 37, 40–43 (1985); John J. Gumperz & Stephen C. Levinson, *Introduction: Linguistic Relativity Re-Examined*, in *RETHINKING LINGUISTIC RELATIVITY* 1, 4–5 (John J. Gumperz & Stephen C. Levinson eds., 1996); John E. Joseph, *The Immediate Sources of the “Sapir Whorf Hypothesis”*, 23 HISTORIOGRAPHIA LINGUISTICA 365 (1996); E.F. Konrad Koerner, *The Sapir-Whorf Hypothesis: A Preliminary History and a Bibliographical Essay*, 2 J. LINGUISTIC ANTHROPOLOGY 173 (1992).

conventional wisdom of the day that regarded Western European cultures and languages as superior to others in favor of a belief that all languages and cultures are of equal worth. Boas rejected claims that the structure of a language limited its speakers' ability to engage in abstract thought.²⁰ Interestingly, at times Boas appeared to endorse the existence of a fundamental grammar that spans all languages based in fundamental psychological processes²¹ that preexist language,²² while on other occasions he emphasizes how the grammar of different languages may incorporate "different fundamental categories."²³

Boas's student, Edward Sapir, extended his work by taking a more systematic approach to the study of language.²⁴ Sapir believed that "[l]anguage is a guide to 'social reality'" and that "[h]uman beings . . . are very much at the mercy of the particular language that has become the medium of expression for their society."²⁵ As a result, "the 'real world' is to a large extent unconsciously built upon the language habits of the group," with different languages creating a different "social reality" and speakers of different languages live in "distinct worlds, not merely the same world with different labels attached."²⁶ Like Boas, Sapir stopped short of advancing the deterministic claim that a person's native language limits their ability to perceive reality or

²⁰ Franz Boas, *Introduction*, in HANDBOOK OF AMERICAN INDIAN LANGUAGES, PART 1, at 1, 64 (1911) ("It seems very questionable in how far the restriction of the use of certain grammatical forms can really be conceived as a hindrance in the formulation of generalized ideas. It seems much more likely that the lack of these forms is due to the lack of their need.")

²¹ *Id.* at 71 (concluding that "the occurrence of the most fundamental grammatical concepts in all languages must be considered as proof of the unity of fundamental psychological processes"); *id.* at 43 (averring that "in each language only part of the complete concept we have in mind is expressed").

²² *Id.* at 43 (opining that "each language has a peculiar tendency to select this or that aspect of the mental image which is conveyed by the expression of the thought").

²³ *Id.* at 43.

²⁴ See generally EDWARD SAPIR, SELECTED WRITINGS OF EDWARD SAPIR IN LANGUAGE, CULTURE, AND PERSONALITY (David G. Mandelbaum ed., 1983).

²⁵ Edward Sapir, *The Status of Linguistics as a Science*, 5 LANGUAGE 207, 209 (1929).

²⁶ *Id.*

conceive of ideas, stating, “It would be naïve to imagine that any analysis of experience is dependent on pattern expressed in language.”²⁷

But the *locus classicus* of linguistic relativity was provided by an unlikely person, Benjamin Whorf.²⁸ A chemical engineer by training and profession who studied linguistics under Sapir at Yale, Whorf remained outside the academy his entire career and published his key works in nontraditional journals.²⁹ His work did not become widely known until the posthumous publication of a collection of his works in 1956 following his untimely death at the age of forty-four.³⁰

Beyond studying mere words, Whorf analyzed the structure and the grammar of Native American languages. He observed that language represents the primary way that human beings organize the “kaleidoscopic flux of impressions” that bombard them every day.³¹ Individuals do not create those categories themselves. Instead, all speakers are “parties to an agreement” to organize those concepts in a particular way, and that “agreement . . . holds through our speech community and is codified in the patterns of our language.”³² As a result, the categories presented by any particular language are “absolutely obligatory.”³³ Indeed, “we cannot talk at all except by subscribing to the organization and classification of data which the agreement

²⁷ Edward Sapir & Morris Swadesh, *American Indian Grammatical Categories*, 2 *Word* 103 (1946), reprinted in 5 THE COLLECTED WORKS OF EDWARD SAPIR 133, 140 (William Bright ed., 1990).

²⁸ Gumperz & Levinson, *supra* note 19, at 5; Koerner, *supra* note 19, at 181.

²⁹ John B. Carroll, *Introduction*, in BENJAMIN LEE WHORF, LANGUAGE THOUGHT, AND REALITY: SELECTED WRITINGS OF BENJAMIN LEE WHORF 1, 3–5, 16, 18–20 (John B. Carroll ed., 1956). Apparently, Whorf only prepared a single article for an audience of linguists. Hill & Mannheim, *supra* note 8, at 390.

³⁰ WHORF, *supra* note 29.

³¹ Benjamin Lee Whorf, *Science and Linguistics*, 42 *TECH. REV.* 229 (1940), reprinted in BENJAMIN LEE WHORF, LANGUAGE, THOUGHT, AND REALITY: SELECTED WRITINGS OF BENJAMIN LEE WHORF 207, 213 (John B. Carroll ed., 1956).

³² *Id.*

³³ *Id.* at 213–14.

decrees.”³⁴ Thus, “no individual is free to describe nature with absolute impartiality but is constrained to certain modes of interpretation even while he thinks himself most free.”³⁵

The saliences and exclusions embedded in any particular language in turn filter the way its speakers view the world, channeling them towards different perceptions of the same physical phenomena.³⁶ As Whorf noted, “users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers, but must arrive at somewhat different views of the world.”³⁷ From this perspective, “the background linguistic system (in other words, the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself a shaper of ideas, the program and guide for the individual’s mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade.”³⁸

Thus, “[e]very language and every well-knit technical sublanguage incorporates certain points of view and certain patterned resistances to widely divergent points of view.”³⁹ In other words of the editor of Whorf’s collected writings, “the structure of a human being’s language influences the manner in which he understands reality and behaves with respect to it.”⁴⁰

³⁴ *Id.* at 214.

³⁵ *Id.*

³⁶ Whorf, *supra* note 31, at 214.

³⁷ Benjamin Lee Whorf, *Linguistics as an Inexact Science*, 43 *TECH. REV.* 61 (1940), *reprinted in* WHORF, *supra* note 29, at 220, 221.

³⁸ Whorf, *supra* note 31, at 212.

³⁹ Benjamin Lee Whorf, *Language, Mind, and Reality*, *THEOSOPHIST*, Jan./Apr. 1942, *reprinted in* WHORF, *supra* note 29, at 246, 246–47. In this way, Whorf sounded themes that anticipated the influential work, THOMAS R. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (1955). Whorf observed, “These resistances not only isolate artificially the particular sciences from each other; they also restrain scientific spirit as a whole from taking the next great step in development—a step which entails viewpoints unprecedented in science and a complete severance from traditions.” Whorf, *supra*, 247

⁴⁰ John B. Carroll, *Introduction*, *in* WHORF, *supra* note 29, at 1, 23.

Language constrains thought and action⁴¹ and renders linguistically codable concepts more salient and memorable.⁴²

Moreover, people become so habituated to the patterns embodied in their native languages that they internalize them in ways that affect their experiences, feelings, and orientation to the rest of the world.⁴³ The result is a “new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar.”⁴⁴

Whorf supported his claims with empirical observations. For example, Whorf asserted that the fact that the Inuit language contained more distinct words for snow than other languages permitted the Inuit people to perceive a greater variety of distinctions between different types of snow.⁴⁵ Whorf also claimed that the fact that the Hopi language perceived of time as a continuous process instead of as a series of discrete, countable instances caused them to perceive space and time differently.⁴⁶ He regarded Hopi as proving that Newtonian conceptions of time and space are the product of culture and language instead of being the result of objective observations of an underlying universal reality.⁴⁷

⁴¹ STANLEY R. BARRETT, *ANTHROPOLOGY: A STUDENT’S GUIDE TO THEORY AND METHOD* 20 (1996).

⁴² JOHN LYONS, *LANGUAGE AND LINGUISTICS* 305 (1981).

⁴³ GUY DEUTSCHER, *THROUGH THE LANGUAGE GLASS: WHY THE WORLD LOOKS DIFFERENT IN OTHER LANGUAGES* 5, 187, 208 (2010).

⁴⁴ Benjamin Lee Whorf, *Science and Linguistics*, 42 *TECH. REV.* 229 (1940), available at <https://archive.org/details/MIT-Technology-Review-1940-04/page/n15/>, reprinted in BENJAMIN WHORF, *LANGUAGES, THOUGHT, AND REALITY: SELECTED WRITINGS OF BENJAMIN LEE WHORF* 233, 244 (John B. Carroll ed., 1956).

⁴⁵ Whorf, *supra* note 31, at 216. The observation was first advanced by Sapir’s teacher, Franz Boas, *Introduction*, *HANDBOOK OF AMERICAN INDIAN LANGUAGES, PART 1*, at 1, 21–22 (Franz Boas ed., 1911).

⁴⁶ Benjamin Whorf, *The Punctual and Segmentative Aspects of Verbs in Hopi*, 12 *LANGUAGE* 127 (1936), reprinted in *LANGUAGES, THOUGHT, AND REALITY*, *supra* note 44, at 51.

⁴⁷ Benjamin Whorf, *The Relation of Habitual Thought and Behavior to Language*, in *LANGUAGE, CULTURE, AND PERSONALITY: ESSAYS IN MEMORY OF EDWARD SAPIR* 75 (Leslie Spier ed., 1941), reprinted in *LANGUAGES, THOUGHT, AND REALITY*, *supra* note 44, at 134, 152–53. Whorf reportedly believed that this difference in language

Methodologically, Boas, Sapir, and Whorf shared a belief that linguistics required the deep, contextual study of specific languages as they are actually practiced. In so doing, they disagreed with those favoring the abstract study of languages, who believed that language and culture were distinct and that insight could be obtained without fluency in the language being studied.⁴⁸

These linguistic theories have deep philosophical roots as well. For example, Immanuel Kant built on the Platonic vision of a real world cannot be directly perceived, which he called the *noumenal* world. Instead, people could perceive of the *phenomenal* world, which is the product of physical the senses interpreted through a person's categories of understanding.⁴⁹ Ludwig Wittgenstein explicitly tied cognition to language when he averred, "The litmus of my language means the limits of the world" and "[a]bout which one cannot speak, one must remain silent."⁵⁰ Friedrich Nietzsche famously called language a "prison house" that shapes thought.⁵¹ Bertrand Russell believed that the "logically perfect language" he had created "will be completely analytic, and will show at a glance the logical structure of the facts asserted or denied."⁵² Other philosophers argued that different languages can offer different representations of the world,⁵³ including such notables as Francis Bacon, Rene Descartes, and Gottfried Leibniz, who

would permit Hopi to understand Einstein's theory of relativity more easily. Frank Heynick, *From Einstein to Whorf: Space, Time, Matter, and Reference Frames in Physical and Linguistic Relativity*, 45 SEMIOTICA 35 (1983).

⁴⁸ Hill & Mannheim, *supra* note 8, at 386.

⁴⁹ See M.A. Smirnov, *Kantian Philosophy and "Linguistic Kantianism"*, 37 KANTIAN J. 32 (2018); Ralph L. Carnes, *A Perceptual Model of the Whorfian Hypothesis*, 71 ETC: REV. GEN. SEMANTICS 263, 265–68 (2014). On the connections between Plato and linguistic relativism, see T.D. Crawford, *Plato's Reasoning and the Sapir-Whorf Hypothesis*, 13 METAPHILOSOPHY 217 (1982).

⁵⁰ See Ranjit Chatterjee, *Reading Whorf Through Wittgenstein: A Solution to the Linguistic Relativity Problem*, 67 LINGUA 37 (1985).

⁵¹ See Graham Parkes, *Nietzsche on the Fabric(ation) of Experience*, 9/10 J. NIETZSCHE STUD. 7, 25–26 (1995). Robert P. Pula, *The Nietzsche-Korzybski-Sapir-Whorf Hypothesis?*, 49 ETC: REV. GEN. SEMANTICS 50 (1992); Tracy B. Strong, *Language and Nihilism: Nietzsche's Critique of Epistemology*, 3 THEORY & SOC'Y 239 (1976); Bradd Shore, *Is Language a Prisonhouse?*, 2 CULTURAL ANTHROPOLOGY 115, 117–20 (1987).

⁵² BERTRAND RUSSELL, *THE PHILOSOPHY OF LOGICAL ATOMISM* 58 (1918).

⁵³ WILLARD VAN ORMAN QUINE, *WORLD AND OBJECT* 51–57 (1965).

speculated that an artificially constructed language “could more accurately capture the true essence of things.”⁵⁴ Thomas Kuhn’ would later offer a related argument in the field of the history of science, asserting that the paradigm under which scientists operate at any particular time filter the way they perceive data and can even lead them to reject valid data that are inconsistent with that paradigm.⁵⁵

The literature began to distinguish between strong and weak versions of the hypothesis.⁵⁶ The strong version, often called *linguistic determinism*, claims that a person’s native language determines her thought and worldview.⁵⁷ The weak version more modestly claims that a person’s native language influences her thoughts and worldview, typically called *linguistic relativity*, which regards thought and action as linguistically and socially mediated.⁵⁸

The Sapir-Whorf hypothesis commanded considerable attention during the 1950s and 1960s, generating a significant body of supportive scholarship and series of conferences devoted to the topic.⁵⁹ Early empirical studies seemed to confirm the weak version of the hypothesis by showing speakers of different languages could better remember colors that were more salient in their native language.⁶⁰ Another oft-cited study conducted by Alfred Bloom claimed that the fact that the Chinese lacks a subjunctive voice made it more difficult for Chinese speakers to

⁵⁴ Joshua Foer, *Utopian for Beginners: An Amateur Linguist Loses Control of the Language He Invented*, NEW YORKER, Dec. 24, 2012, available at <https://www.newyorker.com/magazine/2012/12/24/utopian-for-beginners>.

⁵⁵ KUHN, *supra* note 39.

⁵⁶ DAN I. SLOBIN, PSYCHOLINGUISTICS 122 (1971).

⁵⁷ *Id.* at 120.

⁵⁸ SLOBIN, *supra* note 56, at 120.

⁵⁹ Koerner, *supra* note 19, at 182; DELL H. HYMES, ESSAYS IN THE HISTORY OF LINGUISTIC ANTHROPOLOGY 174–76 (1983); ROBERT L. MILLER, THE LINGUISTIC RELATIVITY PRINCIPLE AND HUMBOLDTIAN ETHNOLINGUISTICS: A HISTORY AND APPRAISAL 12 n.6 (1968).

⁶⁰ For brief surveys of the early empirical literature, see Paul Kay & Willett Kempton, *What Is the Sapir-Whorf Hypothesis?*, 86 AM. ANTHROPOLOGIST (n.s.) 65, 66–67 (1984); and LYONS, *supra* note 42, at 307–22.

understand counterfactuals.⁶¹ Through the first half of the twentieth century, linguistic relativity had clearly established itself as the organizing principle for studying the connection between language and thought.⁶²

B. Chomsky and Universal Grammar

The 1960s witnessed the rise of a new school of thought championed by Noam Chomsky that rejected the importance of linguistic differences and instead conceived of language in more universal terms. Chomsky's theory was a response to the behaviorism of B.F. Skinner that was the dominant paradigm of the day that sought to explain language as the environmental product of stimulus-response and eschewed any analysis of psychological processes.⁶³ Behaviorism treated internal mental processes as a black box and focused on predicting future actions based on evidence from the past.⁶⁴

Chomsky countered that children could not possibly be exposed to sufficiently stimuli in the time they learn language for contextual factors to be the sole explanation.⁶⁵ Instead, all languages must reflect a universal grammar that is genetically encoded into all people, reflected in his now famous claim that people innately regard the structure of the sentence, “colorless green ideas sleep furiously,” as grammatically correct even though the sentence is itself

⁶¹ ALFRED H. BLOOM, *THE LINGUISTICS SHAPING OF THOUGHT* (1981).

⁶² Gumperz & Levinson, *supra* note 19, at 2.

⁶³ B.F. SKINNER, *VERBAL BEHAVIOR* (1957).

⁶⁴ Yarden Katz, *Norm Chomsky on Where Artificial Intelligence Went Wrong*, ATL., Nov. 1, 2012, <http://www.theatlantic.com/technology/archive/2012/11/noam-chomsky-on-where-artificial-intelligence-went-wrong/261637/>.

⁶⁵ George A. Miller & Noam Chomsky, *Finitary Models of Language Users*, in 2 *HANDBOOK OF MATHEMATICAL PSYCHOLOGY* 419, 429–30 (R. Duncan Luce et al. eds., 1963).

meaningless.⁶⁶ Language acquisition involves learning the meanings; children’s understanding of grammatical structure is, in contrast, innate.

The existence of such a universal grammar would undercut claims that differences in the structures of different languages could have any impact on the way a person thought or saw the world. Moreover, it favors approaching “language acquisition as a logical problem that can be solved in principle without looking at the development of actual children in detail.”⁶⁷ As a result, Chomsky was sharply critical of the Whorfian connection between grammatical categories and world view as well as his bottom-up contextual approach to studying language.⁶⁸

At the same time, linguistic relativity also received a strong challenge from cognitive psychology, which began emphasizing “the commonality of human cognition and its basis in human genetic endowment.”⁶⁹ For example, Steven Pinker argues that thought is completely independent of language and rejects the idea that people think in a native language.⁷⁰ Instead, Pinker asserts that people think in a meta-language he calls “mentalese.”⁷¹ To these scholars, language ability is a genetic trait shared by the entire human race.⁷²

An empirical literature began to emerge that sought to corroborate universal grammar. For example, Brent Berlin and Paul Kay showed that different languages that used the same number of focal colors tended to use the same colors, suggesting that the concept of colors likely have a biological root.⁷³ Other studies attempted to debunk the specific examples regarding

⁶⁶ CHOMSKY, *supra* note 12, at 15.

⁶⁷ COOK & NEWSON, *supra* note __, at 78.

⁶⁸ Noam Chomsky, *Introduction*, in ADAM SCHAFF, LANGUAGE AND COGNITION v (Olgiard Wojtasiewicz transl. & Robert S. Cohen ed., 1973).

⁶⁹ Gumperz & Levinson, *supra* note 19, at 2–3.

⁷⁰ STEVEN PINKER, THE LANGUAGE INSTINCT 67–73 (1994).

⁷¹ *Id.* at 82.

⁷² *Id.* at 10; *see also* CHOMSKY, *supra* note 12, at xii.

⁷³ BRENT BERLIN & PAUL KAY, BASIC COLOR TERMS (1969).

references to time in Hopi (even calling it “hoax”),⁷⁴ the number of words for describing snow in Inuit,⁷⁵ and the Chinese language’s inability to reflect counterfactuals,⁷⁶ with one study characterizing the scholarship on Inuit as a “hoax.”⁷⁷ Others focused their criticism on the inherent circularity in experimental designs that rely on language to determine what a person is thinking. As Daniel Casasanto helpfully summarizes the critique, “the only evidence that people who *talk* differently also *think* differently is that they *talk* differently!”⁷⁸ The basic principle that correlation cannot prove causation means that the causal direction of the effect is ambiguous and that both effects may be caused by a third unobserved factor. Attempts to conduct field tests of the hypothesis failed when the community supporting the test language fragmented.⁷⁹

Interestingly, the differences between Chomsky’s views on the one hand and Boas’s, Sapir’s, and Whorf’s views on the other hand may not have been as extreme as is sometimes surmised. In the words of one commentator, “Boas, Sapir, and Whorf were not relativists in the extreme sense often suggested by modern critics, but assumed instead a more limited position, recognizing that linguistic and cultural particulars intersect with universals.”⁸⁰ Indeed, Whorf recognized the existence of “a universal . . . way of linking experiences which shows up in

⁷⁴ EKKEHART MALOTKI, HOPI TIME: A LINGUISTIC ANALYSIS OF THE TEMPORAL CONCEPTS IN THE HOPI LANGUAGE (1983).

⁷⁵ Piotr Cichocki & Marcin Kilarski, *On “Eskimo Words for Snow”: The Life Cycle of a Linguistic Misconception*, 37 HISTORIOGRAPHIA LINGUISTICA 341 (2010); Laura Martin, “Eskimo Words for Snow”: A Case Study in the Genesis and Decay of an Anthropological Example, 88 AM. ANTHROPOLOGIST (n.s.) 418 (1986); Geoffrey K. Pullum, *The Great Eskimo Vocabulary Hoax*, 7 NAT. LANGUAGE & LINGUISTIC THEORY 275 (1989).

⁷⁶ Terry Kil-Fong Au, *Chinese and English Counterfactuals: The Sapir-Whorf Hypothesis Revisited*, 17 COGNITION 155 (1984); Lisa Garbern Liu, *Reasoning Counterfactually in Chinese: Are There Any Obstacles?*, 21 COGNITION 239 (1985); Yohtaro Tokano, *Methodological Problems in Cross-Cultural Studies of Linguistic Relativity*, 31 COGNITION 141 (1989).

⁷⁷ Pullum, *supra* note 75.

⁷⁸ See Daniel Casasanto, *Who’s Afraid of the Big Bad Whorf? Crosslinguistic Differences in Temporal Language and Thought*, 58 LANGUAGE LEARNING 63, 67 (2008).

⁷⁹ See *infra* note 198 and accompanying text (on the failure of Loglan).

⁸⁰ Hill & Mannheim, *supra* note 8, at 383.

laboratory experiments and appears to be independent of language—basically alike for all persons.”⁸¹

Nonetheless, advocates of the universal grammar adopted a surprisingly dismissive and combative tone when criticizing Whorf’s work.⁸² Other attacks against linguistic relativity have been more *ad hominem*. For example, instead of engaging with the merits of Whorf’s work, some critics attempted to dismiss him as an amateur.⁸³ Others have defended Whorf and other linguistic relativists against these attacks. They argued that many of the attacks are based on mischaracterizations of Whorf’s work.⁸⁴ Others attempted to rebut the challenges to Whorf’s examples,⁸⁵ noting that the derisive tone of these critiques “hindered sophisticated discussion about the issues” and that the critics’ analysis fell prey to the same flaws they accused Whorf of perpetrating.⁸⁶ As for the personal criticisms leveled at Whorf, his supporters point to the

⁸¹ Whorf, *supra* note 39, at 267

⁸² See, e.g., PINKER, *supra* note 70, at 57 (calling the Sapir-Whorf hypothesis, “wrong, all wrong” and “a conventional absurdity”); Pullum, *supra* note 75. Indeed, Pinker referred to his 1994 book as the Sapir-Whorf hypothesis’s “obituary.” STEVEN PINKER, *THE STUFF OF THOUGHT* 124 (1997).

⁸³ PINKER, *supra* note 70, at 59–60; Pullum, *supra* note 75, at 276.

⁸⁴ GEORGE LAKOFF, *WOMEN, FIRE, AND DANGEROUS THINGS* 328 (1987); PENNY LEE, *THE WHORF THEORY COMPLEX—A CRITICAL RECONSTRUCTION* (1996); JOHN A. LUCY, *LANGUAGE DIVERSITY AND THOUGHT: A REFORMULATION OF THE LINGUISTIC RELATIVITY HYPOTHESIS* 149, 286 (1992); JOHN LEAVITT, *LINGUISTIC RELATIVITIES: LANGUAGE DIVERSITY AND MODERN THOUGHT* 179–87 (2011); Alford, *supra* note 19, at 86–89; David W. Dinwoodie, *Time and the Individual in Native North America*, in *NEW PERSPECTIVES ON NATIVE NORTH AMERICA: CULTURES, HISTORIES, AND REPRESENTATIONS* (Sergei Kan et al. eds., 2006); Kodish, *supra* note 17, at 384–85, 388, 390; Stephen O. Murray, *Canonical Texts*, 89 *AM. ANTHROPOLOGIST* (n.s.) 443 (1987).

⁸⁵ For rehabilitations of Whorf’s analysis of Hopi, see JOHN LEAVITT, *LINGUISTIC RELATIVITIES: LANGUAGE DIVERSITY AND MODERN THOUGHT* 180 (2011); JOHN A. LUCY, *LANGUAGE DIVERSITY AND THOUGHT: A REGULATION OF THE LINGUISTIC RELATIVITY HYPOTHESIS* 286 (1992); David W. Dinwoodie, *Time and the Individual in Native North America*, in *NEW PERSPECTIVES ON NATIVE NORTH AMERICA: CULTURES, HISTORIES AND REPRESENTATIONS* 341 (Sergei Kan ed., 2006); Kodish, *supra* note 17, at 390; Penny Lee, *Whorf’s Hopi Tensors: Subtle Particulars in the Language/Thought Nexus?*, 3 *LINGUISTICS* 123 (1991); Stephen C. Levinson, *Foreword*, in *LANGUAGE, THOUGHT, AND REALTY* vii, xii (2d ed. 2012); John A. Lucy, *The Scope of Linguistic Relativity: An Analysis of Empirical Research*, in *RETHINKING LINGUISTIC RELATIVITY*, *supra* note 19, at 37, 43.

For rehabilitations of Whorf’s analysis of Inuit words for snow, see Kodish, *supra* note 17, at 390; Igor Krupnik & Ludger Müller-Wille, *Franz Boas and Inuktitut Terminology for Ice and Snow: From the Emergence of the Field to the “Great Eskimo Vocabulary Hoax,”* in *KNOWING OUR ICE: DOCUMENTING INUIT SEA ICE KNOWLEDGE AND USE* 377 (Igor Krupnik et al. eds., 2010).

⁸⁶ Cichocki & Kilarski, *supra* note 75, at 367, 368–69, 371; see also Margalit Fox, *Charles Hockett, 84, Linguist with an Anthropological View*, *N.Y. TIMES*, Nov. 13, 2000, at __, available at

recognition he received during his lifetime⁸⁷ and recharacterized being called an amateur as a badge of honor worthy of the word's noble origins as “a *lover* of the subject”⁸⁸ that more reflected the shortcomings of linguistics as an academic profession than any deficiencies in Whorf's work.⁸⁹

Despite these efforts to defend linguistic relativity, by the 1980s, Chomsky's theory of universal grammar emerged as the dominant paradigm,⁹⁰ and linguistic relativity was clearly in decline.⁹¹ Even as sympathetic an observer as the editor of the landmark 1956 compilation of Whorf's works was forced to conclude in 1992 that “most linguists and psychologists believe that evidence offered in [the Sapir-Whorf hypothesis's] support is flawed” and that the Sapir-Whorf hypothesis “has come to be regarded as either unconfirmable or incorrect.”⁹² Steven Pinker even authored what he called its “obituary,” calling it “wrong, all wrong” and “a

<http://www.nytimes.com/2000/11/13/arts/charles-hockett-84-linguist-with-an-anthropological-view.html> (describing Chomskyan linguistics as “a theory spawned by a generation of vipers”).

⁸⁷ REGNA DARNELL, EDWARD SAPIR: LINGUIST, ANTHROPOLOGIST, HUMANIST 380–81 (1990); LUCY, *supra* note 84, at 25.

⁸⁸ Garrett Hardin, *Meaningless of the Word Protoplasm*, 82 SCI. MONTHLY 112, 115 (1956); C.R. Sankaran, *Recent Trends in the Researches on the Psychophysics of Indian Music*, 19 BULL. DECCAN C. RES. INST. 125, 130 (1958).

⁸⁹ Russell F.W. Smith, *Linguistics in Theory—And in Practice*, 10 ETC: REV. GEN. SEMANTICS 46, 49 (1952); Harold Whitehall, *Daring Amateur*, 13 KENYON REV. 346, 346–47 (1951).

⁹⁰ Kodish, *supra* note 17, at 387 (writing in 2003–2004 that “[t]he theory of Noam Chomsky has dominated linguistic studies in the United States for decades”).

⁹¹ See LAKOFF, *supra* note 84, at 304 (“For the past few decades, most ‘responsible’ scholars have steered clear of relativism. It has become a *bête noire*, identified with scholarly irresponsibility, fuzzy thinking, lack of rigor, and even immorality.”); Alford, *supra* note 19, at t 85 (quoting Paul Kay as saying that “it is as much in vogue today to be anti-Whorf as it was to be pro-Whorf in the early ‘50s”); Casasanto, *supra* note 78, at 63 (observing that linguistic relativity “has long been decried as not only wrong but also fundamentally wrong-headed”); Koerner, *supra* note 19, at 182 (noting the drop off in the number of meetings on linguistic relativity between the 1950s and the 1970s).

⁹² See Alford, *supra* note 19, at 85 (“[a]most every discussion about Whorf in the literature is negative in character, and argues for substantial rejection of this Whorf Hypothesis”); John B. Carroll, *Benjamin Lee Whorf*, in 4 INTERNATIONAL ENCYCLOPEDIA OF LINGUISTICS 240, 241 (William Bright ed., 1992); Gumperz & Levinson, *supra* note 19, at 3 (observing how linguistic relativity “seemed entirely and abruptly discredited by the rise of the cognitive sciences in the 1960s”); J.R. Minkel, *A Way with Words*, SCI. AM. (Mar. 25, 2002), <https://www.scientificamerican.com/article/a-way-with-words/> (noting that “the Whorfian hypothesis became more than neglected—it was sort of ridiculed”).

conventional absurdity.”⁹³ Some commentators even spoke of its death or its demise and conducted autopsies exploring why.⁹⁴ Konrad Koerner more optimistically predicted a revival of interest in the 1990s.⁹⁵

C. The Revival of Linguistic Relativity

Koerner was ultimately proved correct: Since the 1990s, linguistic relativity has enjoyed something of a renaissance.⁹⁶ The intellectual focus has shifted away from the purported impact that a language’s structure and grammar can have on people’s thoughts. Instead, scholars have begun exploring the impact that contextual uses of certain language can have on people’s thoughts.

A new generation of empiricists has begun to explore new dimensions of linguistic relativity.⁹⁷ Paul Kay, who coauthored the study widely regarded as establishing color as a universal concept,⁹⁸ conducted new experiments indicating that “a more cautious Whorfianism

⁹³ PINKER, *supra* note 70, at 57, 124.

⁹⁴ Alford, *supra* note 19 (subtitled “The Demise of the Whorf Hypothesis”).

⁹⁵ Koerner, *supra* note 19, at 183.

⁹⁶ Casasanto, *supra* note 78, at 69 (noting that since Pinker’s self-described 1994 obituary for linguistic relativity, “Whorfian research has experienced a renaissance”); Gumperz & Levinson, *supra* note 19, at 3 (noting in 1996 that “there has been a recent change of intellectual climate . . . towards an intermediate position, in which more attention is paid to linguistic and cultural difference”); E.F. Konrad Koerner, *The Sapir-Whorf Hypothesis: A Preliminary History and a Bibliographical Essay*, 2 J. LINGUISTIC ANTHROPOLOGY 173, 183 (1992) (noting signs of an early revival of interest linguistic relativity in the early 1990s); Hartshorne, *supra* note 13 (noting that since Pinker declared Whorfianism dead in 1994, “Whorfianism has undergone a small resurgence”); Minkel, *supra* note 92 (discussing “the Whorfian renaissance during the early 1990s”). For brief reviews of recent empirical contributions to this literature, see Diego Feinmann, *Language and Thought in the Motion Domain: Methodological Considerations and New Empirical Evidence*, 49 J. PSYCHOLINGUISTIC RES. 1, 1–3 (2020); Jordan Zlatev & John Blomberg, *Language May Indeed Influence Thought*, FRONTIERS IN PSYCHOL., Oct. 2015, art. 1631, at 2, <https://www.frontiersin.org/articles/10.3389/fpsyg.2015.01631/>.

⁹⁷ For a catalog of important works, see Casasanto, *supra* note 78, at 69.

⁹⁸ See *supra* note 73 and accompanying text.

seems to be supported by the results reported here.”⁹⁹ Other color studies have found similar effects.¹⁰⁰ Studies focusing on spatial characterizations in language have shown that members of an aboriginal culture in Australia whose language describes space in cardinal-direction terms (north, south, east, west) demonstrated better spatial knowledge and arranged items in sequence in a different manner (east-to-west) than did speakers of language who describe space in relative-direction terms (left, right, forward, backward).¹⁰¹

Other studies suggest that speakers of languages that use horizontal metaphors for time perceive the world differently than speakers of languages that use vertical metaphors for time.¹⁰² Similarly, the ability to estimate duration of time varied based on whether the speaker’s language measured to duration in terms of length (long, short) instead of amount (big, little).¹⁰³ Still other studies have examined how grammatical gender in a language can affect perception.¹⁰⁴ New research methods have emerged, such as those studying the perception of motion and emotion¹⁰⁵ and those comparing bilingual and monolingual speakers.¹⁰⁶ Perhaps most celebratedly, the fact that the language spoken by Brazil’s Pirahã tribe lacks many supposedly universal features of

⁹⁹ Paul Kay & Willett Kempton, *What Is the Sapir-Whorf Hypothesis?*, 86 AM. ANTHROPOLOGIST (n.s.) 65, 77 (1984). Kempton would later describe “seeing the Whorfian effect with our own eyes” as “powerful a conversion experience unlike anything I’ve experienced in my scientific career.” Kodish, *supra* note 17, at 391.

¹⁰⁰ J. Davidoff et al., *Colour Categories in a Stone-Age Tribe*, 398 NATURE 203 (1999); Jonathan Winawer et al., *Russian Blues Reveal the Effect of Language on Color Discrimination*, 104 PROC. NAT’L ACAD. SCI. 7780 (2007).

¹⁰¹ Stephen C. Levinson, *Frames of Reference and Molyneux’s Question: Cross-Linguistic Evidence*, in LANGUAGE AND SPACE 109 (P. Bloom et al. eds., 1996).

¹⁰² Lera Boroditsky, *Do English and Mandarin Speakers Think Differently About Time?*, 118 COGNITION 123 (2011).

¹⁰³ Daniel Casasanto et al., *How Deep Are Effects of Language on Thought? Time Estimation in Speakers of English, Indonesian, Greek, and Spanish*, PROC. 26TH ANN. CONF. COGNITIVE SCI. SOC’Y 275 (2004); see also L. McDonough et al., *Understanding Spatial Relations: Flexible Infants, Lexical Adults*, 46 COGNITIVE PSYCHOL. 229 (2003) (looking at differences in characterization of loose and tight fits based on language differences).

¹⁰⁴ Lera Boroditsky et al., *Sex, Syntax, and Semantics*, in LANGUAGE IN MIND: ADVANCES IN THE STUDY OF LANGUAGE AND COGNITION 61 (Dedre Gentner & Susan Golkin-Meadow eds., 2003).

¹⁰⁵ CATHERINE A. LUTZ, UNNATURAL EMOTIONS: EVERYDAY SENTIMENTS ON A MICRONESIAN ATOLL & THEIR CHALLENGE TO WESTERN THEORY (1988).

¹⁰⁶ Viorica Marian & Caitlin M. Fausey, *Language-Dependent Memory in Bilingual Learning*, 20 APPLIED COGNITIVE PSYCHOL. 1025 (2006).

language, including numbers, color, dependent clauses, myths, fiction, and art and used the simplest forms of pronouns and kinship references raises doubts about the universality of certain language structures.¹⁰⁷ Indeed, the lack of numbers appears to limit the Pirahã's ability to do mathematics.¹⁰⁸

One of the more recent forays into the ways that language can affect thought is known as *evidentiality*,¹⁰⁹ which has become a hot topic in linguistics circles.¹¹⁰ Although the concept was first recognized by Boas,¹¹¹ Roman Jakobson introduced the term “evidential” into the linguistic vocabulary in 1957.¹¹² Languages that use evidentials mandate as part of their grammar that the speaker “specify the information source in which a statement is based—whether the speaker saw the event happen, didn’t see it but heard it (or smelt it), made an inference about it based on visual traces or reasoning or general knowledge, or was told about it.”¹¹³ Evidentials’ obligatory nature in these languages increases the availability and salience of information sources¹¹⁴ and accents “[t]he distinction between ‘self’ and ‘other.’”¹¹⁵ They also require a level of specificity

¹⁰⁷ Daniel L. Everett, *Cultural Constraints on Grammar and Cognition in Pirahã*, 46 CURRENT ANTHROPOLOGY 621 (2005).

¹⁰⁸ Peter Gordon, *Numerical Cognition Without Words: Evidence from Amazonia*, 306 SCI. 496 (2004). Other scholars dispute whether the Pirahã's inability to do mathematics is the result of language-induced inability or the lack of environmental need for the skill. Daniel Casasanto, *Crying “Whorf,”* 307 SCI. 1721 (2005).

¹⁰⁹ See Alexandra Y. Aikhenvald, *Evidentiality: The Framework*, in OXFORD HANDBOOK OF EVIDENTIALITY 1, 2 (Alexandra Y. Aikhenvald ed., 2018) (characterizing evidentiality as “a relatively recent arrival on the linguistic scene”).

¹¹⁰ See ALEXANDRA Y. AIKHENVALD, EVIDENTIALITY 16 & n.12 (2004) (calling evidentials “the flavor of the month” and critically discussing the “surge of interest” reflected in the “large number of publications and definitions”).

¹¹¹ Franz Boas, *Introduction*, in HANDBOOK OF AMERICAN INDIAN LANGUAGES 5, 43 (Franz Boas ed., 1911) (noting that in Kwakiutl, speakers must indicate whether they have seen something themselves, knows it by hearsay or evidence, or dreamed it); accord Franz Boas, *Language*, in GENERAL ANTHROPOLOGY 124, 133 (Franz Boas ed., 1938) (noting that some languages include the “source of information—whether seen, heard, or inferred—as obligatory aspects”).

¹¹² ROMAN O. JAKOBSON, SHIFTERS, VERBAL CATEGORIES, AND THE RUSSIAN VERB 4–5 (1957) (introducing the evidential as a verbal category); AIKHENVALD, *supra* note 110, at 13.

¹¹³ Aikhenvald, *supra* note 109, at 1.

¹¹⁴ Anna Papafragou et al., *Evidentiality in Language and Cognition*, 103 COGNITION 253, 255 (2007).

¹¹⁵ AIKHENVALD, *supra* note 110, at 381.

that can change discourse and politics.¹¹⁶ Their use also becomes embedded in social practices.¹¹⁷ Indeed, those coming from language traditions requiring evidentials feel the gap when speaking languages that do not require them.¹¹⁸ These speakers may even greet the failure to provide the evidential provenance of reported information with suspicion.¹¹⁹ Moreover, evidentiality's implications for linguistic relativity are clear.¹²⁰

A shift in developmental psychology, while continuing to recognize the importance of universals, began to place renewed emphasis on the role that cultural context plays.¹²¹ At the same time, linguistics and anthropology have focused increased attention on how the ways that language is used can create meaning in ways that go beyond lexicon and grammar in ways that seem culturally specific. For example, Alan Rumsey followed Whorf's structural approach and compared European languages' ability to report the exact wording of quoted speech and the lack of similar structures in the language of the Ngarinyin people of northwestern Australia.¹²² George Lakoff argued that the key to understanding language is not its structure and its grammar, but rather the metaphors that it embodies, which can affect the way speakers of the language perceive different phenomena.¹²³

The linguistic relativity revival has also drawn support from the perceived inadequacies of universal grammar, which Chomsky initially refined into a theory known as Principles and

¹¹⁶ Alexandra Aikhenvald's seminal monograph rhetorically asks, "Wouldn't it be good if our politicians were obliged to say exactly how they learnt so-and-so?" AIKHENVALD, *supra* note 110, at 355; *see also* Franz Boas, *Language and Culture*, in *STUDIES IN THE HISTORY OF CULTURE: THE DISCIPLINES OF THE HUMANITIES* 178, 182 (1942) (noting that "we could read our newspapers with much greater satisfaction if our language would compel them to say whether their reports are based on self-experience, inference, or hearsay!").

¹¹⁷ Aikhenvald, *supra* note 110, at 9, 357–58; Lila San Roque, *Evidentiality*, 48 *ANN. REV. ANTHROPOLOGY* 353, 356 (2019).

¹¹⁸ Aikhenvald, *supra* note 109, at 1.

¹¹⁹ AIKHENVALD, *supra* note 110, at 355; Aikhenvald, *supra* note 109, at 1.

¹²⁰ AIKHENVALD, *supra* note 110, at 355; Papafragou et al., *supra* note 114, at 254.

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¹²² Alan Rumsey, *Wording, Meaning, and Linguistic Ideology*, 92 *AM. ANTHROPOLOGIST* (n.s.) 346 (1990).

¹²³ LAKOFF, *supra* note 84.

Parameters.¹²⁴ The difficulties Chomsky faced in reducing all languages into a single universal grammar led him to divide grammar into a *core*, which consisted of the part subject to the universal grammar, and a *periphery*, which is “whatever is added on in the system actually represented in the mind/brain of a speaker-hearer.”¹²⁵ Chomsky later reformulated his thoughts still further into what he now calls the Minimalist Program, which discards almost all of the previous analytical categories and attempts to identify the attributes for reducing language to its bare essentials.¹²⁶

Critics regard the core/periphery distinction as a telling acknowledgement of the inadequacies of Chomsky’s theory.¹²⁷ Moreover, many regard the shifts in direction and increasing abstraction of Chomsky’s framework as problematic. In the words of Robert Trask:

[Chomsky’s theory] was an abstract framework to begin with, but it has become steadily more abstract, as its proponents, confronted by troublesome data, have tended to posit ever greater layers of abstraction, in the hope of getting their universal principles to apply successfully at some level of representation. Critics have not been slow to see this retreat into abstraction as a retreat from the data altogether, that is as an attempt to shoehorn the data into *a priori* principles which themselves are sacrosanct. The more outspoken critics have declared the [Chomsky] framework to be more a religious movement than an empirical science.¹²⁸

Furthermore, attempts to find universals in grammatical rule systems necessarily depend on first identifying substantive universals, such as the idea of nouns and verbs, that can serve as the building blocks for analysis. In other words, the project of identifying rule systems depends on the existence of a metalanguage that is distinct from all existing languages. Without such an inventory of prior syntactic or semantic properties, one risks relying on familiar categories that

¹²⁴ NOAM CHOMSKY, KNOWLEDGE OF LANGUAGE: ITS NATURE, ORIGIN, AND USE 101, 145 (1986).

¹²⁵ *Id.* at 147.

¹²⁶ Noam Chomsky, *A minimalist program for linguistic theory* (MIT Working Papers in Linguistics 1993).

¹²⁷ John E. Joseph, “Core” and “Periphery” in *Historical Perspective*, 19 HISTORIOGRAPHIA LINGUISTICA 317 (1992).

¹²⁸ R.L. TRASK, KEY CONCEPTS IN LANGUAGE AND LINGUISTICS 109 (1999).

may obscure other types of categories or may risk projecting European substantive properties onto other languages.¹²⁹ And it is precisely this metalanguage that Chomsky and his followers are finding so hard to develop.

Universal grammar has also faced a number of empirical challenges. The inability to teach language to feral children is regarded by some as being more consistent with language being learned through cognitive processes than it being an innate, genetic attribute.¹³⁰ Others have pointed out that the fact that language structure evolves more quickly than genes indicates that language cannot be genetically determined.¹³¹

The problems with Chomsky's insistence on abstraction to the exclusion of contextual analysis is most evident in the debate his views of sparked over artificial intelligence (AI). Recall that Chomsky believed that the proper goal of linguistics was the logical analysis of linguistic structures that match people's internal psychological processes. In so, he rejected the approach that focused on context in a manner reminiscent of behaviorism and Whorfianism. In Chomsky's opinion, "probabilistic models give no particular insight into some of the basic problems of syntactic structure."¹³² Instead, "Linguistic theory is mentalistic, since it is concerned with discovering a mental reality underlying actual behavior. Observed use of language . . . may provide evidence . . . but surely cannot constitute the subject-matter of linguistics, if this is to be a serious discipline."¹³³ As a result, Chomsky criticized statistical modeling and Bayesian approaches to AI for doing nothing more than trying to regenerate prior

¹²⁹ Stephen C. Levinson, *Introduction to Part II*, in *RETHINKING LINGUISTIC RELATIVITY*, *supra* note 19, at 133, 135.

¹³⁰ PHILLIP LIEBERMAN, *EVE SPOKE: HUMAN LANGUAGE AND HUMAN EVOLUTION* (1998).

¹³¹ Moren H. Christiansen & Nick Chater, *Language as Shaped by the Brain*, 31.5 *BEHAVIORAL & BRAIN SCI.* 489 (2008); TERRENCE DEACON, *THE SYMBOLIC SPECIES: THE CO-EVOLUTION OF LANGUAGE AND THE BRAIN* (1997).

¹³² CHOMSKY, *supra* note 12, at 17.

¹³³ NOAM CHOMSKY, *ASPECTS OF THE THEORY OF SYNTAX* 4 (1969).

observations.¹³⁴ In Chomsky's view, systems that simply regenerate past data do not improve the scientific understanding of the phenomenon.¹³⁵

In this sense, Chomsky endorses what is sometimes called *strong AI*, which seeks to build systems that perform tasks the same way people do, and rejects *weak AI*, which simply seeks to build systems that work regardless of whether their structure models human cognition.¹³⁶ In other words, strong AI employs a non-behaviorist approach in an attempt to gain insights into human cognition. Weak AI uses a behaviorist approach to look for statistical regularities in large datasets and treats the internal workings as a black box.¹³⁷ Chomsky denigrated the latter approach as unlikely to yield any explanatory insights or general principles about the nature of cognition.¹³⁸

Chomsky's critique prompted a response from Peter Norvig, who is the Director of Research and an AI expert at Google.¹³⁹ Norvig points to a paper by Leo Breiman arguing that statistical modeling falls into two cultures.¹⁴⁰ The first culture attempts to create models that mimic the mechanisms of nature as closely as possible. These results they produce provide insights into the model, not nature. The second attempts to create algorithms that map inputs to outputs without any expectation that they will do so in a manner that reflects the underlying

¹³⁴ Noam Chomsky, MIT Institute Professor, Emeritus, Keynote Panel on The Golden Age — A Look at the Original Roots of Artificial Intelligence, Cognitive Science, and Neuroscience, MIT 150 Symposium on Brains, Minds and Machines (May 3, 2011), available at <http://languageelog ldc.upenn.edu/myl/PinkerChomskyMIT.html>.

¹³⁵ *Id.*

¹³⁶ John Pate, *A Response to Noam Chomsky on Where Artificial Intelligence Went Wrong*, RANDOM WORDS, Nov. 26, 2012, http://jkpate.net/random_words/2012/11/26/a-response-to-noam-chomsky-on-where-artificial-intelligence-went-wrong/.

¹³⁷ John R. Searle, *Minds Brains, and Programs*, 3 BEHAV. & BRAIN SCI. 417, 417 (1980).

¹³⁸ Yarden Katz, *Noam Chomsky on Where Artificial Intelligence Went Wrong*, ATLANTIC (Nov. 12, 2012), <https://www.theatlantic.com/technology/archive/2012/11/noam-chomsky-on-where-artificial-intelligence-went-wrong/261637/>

¹³⁹ Peter Norvig, *On Chomsky and the Two Cultures of Statistical Learning*, <http://www.norvig.com/chomsky.html>.

¹⁴⁰ *Id.*

nature of the phenomenon being modeled.¹⁴¹ Although these latter models model reality accurately, they make no attempt to correspond to the processes used by nature and thus provide no analytical insight as to mechanisms. In short, they “describe[] what *does* happen, but . . . [don’t] answer the question of *why*.”¹⁴²

Norvig argues that Chomsky’s views reflect his commitment to finding elegant descriptions of the “deep *whys*” over “mere explanations of reality.”¹⁴³ The result is an approach that regards the study of actual language as out of bounds and instead seeks to reduce the mechanisms of language into an abstract, mathematical form.¹⁴⁴ While elegant, this acontextual approach proved singularly ineffective in generating working AI, particularly when it comes to language.¹⁴⁵

The exchange between Chomsky and his critics over the best approach to AI recapitulates the overarching debate between linguistic relativity and universal grammar. One side favors abstraction and fidelity to cognitive processes at the expense of the ability to explain the features of actual languages and the meaning of actual expressions. The other side focuses on patterns identified through empirical observation without any attempt to map those patterns onto cognitive processes. Perhaps most importantly, modern practitioners of AI criticize the dichotomy as overdrawn. Experiments with different forms of statistical modeling that are tied to linguistic theory can reveal a great deal about that theory’s validity.¹⁴⁶

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¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ John Ball, *Blame Chomsky for Non-Speaking A.I.*, COMPUTERWORLD, June 17, 2015,

<http://www.computerworld.com/article/2929085/emerging-technology/blame-chomsky-for-non-speaking-ai.html>.

¹⁴⁶ Pate, *supra* note 136.

At this point, the debate between linguistic relativity and universal grammar remains unresolved. The ebbs and flows of the debate over the past few decades make it almost certain that the last word has yet to be spoken. To the extent that a consensus exists, it seems to reject the idea that language determines thought, but at the same time accepts that language influences thought in important ways. From this perspective, “what we normally call ‘thinking’ is in fact a complex set of collaborations between linguistic and nonlinguistic representations and processes.”¹⁴⁷ The modern empirical evidence suggests that these mechanisms are quite contextual. On a more fundamental level, the debate reflects the familiar methodological clash between theory and empiricism to which the proper answer is that science needs both.¹⁴⁸

II. LINGUISTIC RELATIVITY AND CONSTRUCTED LANGUAGES

The inconclusive state of the debate between these two schools of thought on the relationship between language and thought does not stop it from having strong implications for copyright. Given that the central claim of linguistic relativity is that the language a person speaks affects the way they perceive and think about the world, one natural question regards the merits of giving authors of *constructed languages* (“conlangs”) exclusive control over their creations.¹⁴⁹ Constructed languages are those languages whose phonology, morphology, syntax, and sometimes alphabet and vocabulary were intentionally devised by one or more humans. As

¹⁴⁷ Lera Boroditsky, *Linguistic Relativity*, in 2 ENCYCLOPEDIA OF COGNITIVE SCIENCE 917, 920 (Lynn Nadel ed., 2003).

¹⁴⁸ On Richard Feynman’s vision about the interconnectedness between theory and empiricism in the context of physics, see LAWRENCE M. KRAUSS, *QUANTUM MAN: RICHARD FEYNMAN’S LIFE IN SCIENCE* 238 (2011).

¹⁴⁹ Constructed languages are also sometimes called invented, artificial, imaginary, model, or planned languages.

such, constructed languages stand in contrast to natural or ethnic languages, which evolved organically without any human control.¹⁵⁰

The debate whether permitting authors to copyright an entire language that they created has important implications for key copyright concepts, including the idea-expression dichotomy, the merger doctrine, and the exclusion of functional works. Part A lays out the different types of constructed languages. Part B applies the insights of the debate over linguistic relativity.

A. Types of Constructed Languages

Reflecting a long tradition that is usually traced back to Hildegard of Bingen's *Lingua ignota* during the 12th century,¹⁵¹ people have devised more than 700 constructed languages over the years, as compared with the roughly 5,000 languages currently being spoken today. Interest appears to be burgeoning, as reflected by the number of courses on constructed languages springing up in universities across the country.¹⁵²

The creation of a constructed language generally follows one of two paths. An *a priori* approach builds a new language from whole cloth without any reference to earlier languages, while *a posteriori* takes an existing language as its starting point.¹⁵³ Many scholars have pointed out that this distinction is better regarded as a spectrum rather than as a strict dichotomy, since no language is completely *a priori*.¹⁵⁴

¹⁵⁰ For a useful introduction, see Adelman, *supra* note 14, at 546.

¹⁵¹ See SARAH L. HIGLEY, HILDEGARD OF BINGEN'S UNKNOWN LANGUAGE: AN EDITION, TRANSLATION, AND DISCUSSION (2007).

¹⁵² Constructed languages are also sometimes called invented, artificial, imaginary, model, or planned languages.

¹⁵³ PIERRE JANTON, ESPERANTO: LANGUAGE, LITERATURE, AND COMMUNITY 5 (Humphrey Tonkin et al. trans., Humphrey Tonkin ed., 1993).

¹⁵⁴ Marc van Oostendorp, *Language contact and constructed languages*, in 1 LANGUAGE CONTACT: AN INTERNATIONAL HANDBOOK 124 (Jeroen Darquennes et al. eds., 2019).

Constructed languages are also categorized by the purpose for which they are intended to serve. Typically, they fall into one of three types: artistic languages, auxiliary languages, and engineered languages.

1. Artistic Languages

Many of the best known constructed languages are *artistic* in nature (artlangs). Prominent examples include the multiple languages invented by J.R.R. Tolkien in *The Lord of the Rings* and his other works, who regarded constructing languages as his “secret vice.”¹⁵⁵ Other prominent examples include Klingon (created for the *Star Trek* franchise), Na’vi (created for the movie *Avatar*), and Dothraki and Valyrian (created for the television series, *Game of Thrones*).

Tolkien undoubtedly regarded the act of constructing a languages to be expressive. In a 1931 address, Tolkien recounts an utterance during the middle of a boring lecture that revealed that the person was working on a constructed language:

The man next to me said suddenly in a dreamy voice: “Yes, I think I shall express the accusative case by a prefix!”

A memorable remark! . . . Just consider the splendour of the words! “I shall express the accusative case. “ Magnificent! Not “it is expressed,” nor even the more shambling “it is sometimes expressed,” nor the grim “you must learn how it is expressed.” What a pondering of alternatives within one’s choice before the final decision in favour of the daring and unusual prefix, so personal, so attractive; the final solution of some element in a design that had hitherto proved refractory. Here were no base considerations of the “practical,” the easiest for the “modern mind,” or for the million – only a question of taste, a satisfaction of a personal pleasure, a private sense of fitness.¹⁵⁶

¹⁵⁵ J.R.R. Tolkien, *A Secret Vice, in THE MONSTERS AND THE CRITICS AND OTHER ESSAYS* 198 (Christopher Tolkien ed., 1983).

¹⁵⁶ *Id.* at 199.

Tolkien followed it with an eloquent reflection on the “incipient pleasure found in *linguistic invention*.”¹⁵⁷ In fact, Tolkien regarded the languages as more important than the stories: “The ‘stories’ were made rather to provide a world for the languages than the reverse.”¹⁵⁸

Authors of languages constructed for artistic purposes often assert copyrights over those languages. For example, the Tolkien estate asserts that it holds a copyright in the languages that Tolkien constructed. In response to a hypothetical question whether others can write stories set in Middle Earth, the FAQ section of the estate’s website unequivocally says no.¹⁵⁹ Although the website does not specify the legal basis for asserting this right or address the use of Tolkien’s constructed languages, subsequent correspondence with counsel for the estate makes clear that the estate believes that it holds a copyright in Tolkien’s constructed languages.¹⁶⁰ The FAQ section for the webpage for “The Elvish Language Fellowship,” which appears to enjoy some degree of approval from the Tolkien Estate,¹⁶¹ takes the same position.¹⁶² On the other hand, a

¹⁵⁷ *Id.* at 206.

¹⁵⁸ J.R.R. TOLKIEN, *THE LETTERS OF J.R.R. TOLKIEN* 219 (Humphrey Carpenter ed., 1981).

¹⁵⁹ Tolkien Estate, *Permissions and Requests*, <http://www.tolkienestate.com/en/paths/faq/permissions-requests.html> (last visited on January 22, 2019).

¹⁶⁰ Theodora Michaels, *Know Your Rights: Copyright Law for the Creator of Fan Works* (Aug. 27, 2008), <http://www.theodoramichaels.com/articles/fan-fic.php> (quoting email correspondence with Tolkien estate counsel Cathleen Blackburn stating, “In relation to Quenya and other Elvish languages, the Tolkien Estate takes the position that these are copyright works and, accordingly, a license is required for any uses of them which would otherwise amount to copyright infringement.”); Email from Cathleen Blackburn, Partner, Maier Blackburn, to Michael Adelman (Dec. 7, 2012, 7:09 EST) (stating that “the Elvish Languages are original literary and artistic works which were created by JRR Tolkien and therefore qualify for copyright protection in most (if not all) jurisdictions worldwide”), *quoted in* Adelman, *supra* note 14, at 552.

¹⁶¹ See Tolkien Estate, *Languages and Writing Systems*, <http://www.tolkienestate.com/en/learning/languages-and-writing-systems.html> (pointing those interested in an introduction to the languages of Middle Earth to an article written by Carl Hofstetter and identifying him as a founding member of the Elvish Literary Foundation).

¹⁶² Carl F. Hofstetter, *The Tolkienian Linguistics FAQ and Frequently Needed Answers*, THE ELVISH LINGUISTIC FELLOWSHIP (Dec. 18, 2006), <http://www.elvish.org/FAQ.html> (stating that “[u]nlike Esperanto (which was explicitly placed into the public domain by its creator), Tolkien’s languages are not in the public domain. As the artistic creations of J.R.R. Tolkien, they enjoy the same copyright protections as his literary works”).

fan magazine secured a legal opinion from the former general counsel of the National Endowment for the Arts stating that Tolkien's languages cannot be copyrighted.¹⁶³

These statements notwithstanding, the Tolkien estate does not appear to have brought any lawsuits to enforce any copyrights in Tolkien's constructed languages that may exist.¹⁶⁴ *Wired* magazine does report that the estate sent a cease and desist letter to Tolkien linguist Helge Fauskanger that successfully deterred him from publishing a sixty-page analysis of two unpublished texts written in the Tolkien-created language, Quenya,¹⁶⁵ even though Fauskanger believes that Tolkien's languages cannot be copyrighted.¹⁶⁶ This case is somewhat atypical in that the works being analyzed were unpublished, a consideration that militates against fair use.¹⁶⁷

Paramount Pictures has similarly taken steps to assert a copyright in Klingon. For example, the studio once sent a cease and desist letter to the Klingon Language Institute (KLI) asking it to stop using the word Klingon in its literature before subsequently giving KLI a copyright and trademark license to Paramount's intellectual property.¹⁶⁸ Since then, Paramount and the KLI have enjoyed a more symbiotic relationship.¹⁶⁹

The copyrightability of Klingon did come closer to having its day in court in *Paramount v. Axanar*, in which studio sued to block a crowd-funded fan film set in the Star Trek universe.¹⁷⁰

¹⁶³ *Legal Opinion by Robert Wade, Esq., on copyright issues, alphabets and languages, fair use, etc.*, TYALIË TYELELLIËVA, Sept. 5, 2000, <https://archive.fo/o/gW78y/www.reocities.com/Athens/Parthenon/9902/legalop.html>.

¹⁶⁴ Adelman, *supra* note 14, at 552.

¹⁶⁵ Eric Davis, *The Fellowship of the Wring*, WIRED, Oct. 2001, available at <https://www.wired.com/2001/10/lotr/>.

¹⁶⁶ Helge Fauskanger, *Quenya Course: Introduction* (last visited January 22, 2019), <http://folk.uib.no/hnohf/intro.rtf>.

¹⁶⁷ See, e.g., *Harper & Row Publ'rs, Inc. v. Nation Enters.*, 471 U.S. 539, 550–55, 563–64 (1985).

¹⁶⁸ *Wired*; KLI, <https://www.kli.org/about-the-kli/> (recognizing that “Klingon, Star Trek, and all related marks are Copyrights and Trademarks of Paramount Pictures”)

¹⁶⁹ Adelman, *supra* note 14, at 554.

¹⁷⁰ *Paramount Pictures Corp. v. Axanar Prod'ns, Inc.*, No. 2:15-CV-09938-RGK-E, 2017 WL 83506 (C.D. Cal. Jan. 3, 2017); accord David Post, *Copyright in Klingon*, VOLOKH CONSPIRACY (Jan. 9, 2017, 9:57 AM), <https://reason.com/volokh/2017/01/09/copyright-in-klingon>.

The Language Creation Society moved for leave to submit an amicus brief arguing that constructed languages were not copyrightable.¹⁷¹ The court denied the motion, noting that because it “d[id] not reach the issue of whether languages, and specifically the Klingon language, are copyrightable . . . none of the information provided by Amicus is necessary to dispose of the Motion to Dismiss.”¹⁷²

The court later issued an opinion denying cross motions for summary judgment, holding that the defendant’s works used elements protected by Paramount’s copyright and that the defendant’s works did not constitute fair use.¹⁷³ The opinion’s discussion of copyrightability focused primarily on the use of characters, the Vulcan and Klingon species, and particular costumes.¹⁷⁴ The court also noted that Paramount and CBS had submitted evidence regarding the use of other aspects of the Star Trek universe, including, most importantly for this Article, the Klingon language.¹⁷⁵ The court sidestepped the issue whether Klingon is by itself

¹⁷¹ Brief of Amicus Curiae the Language Creation Society, *Paramount Pictures Corp. v. Axanar Prod’ns, Inc.*, No. 2:15-CV-09938-RGK-E, 2017 WL 83506 (C.D. Cal. Jan. 3, 2017) (filed May 9, 2016), *available at* <https://drive.google.com/file/d/0BzmetJxi-p0VM19nbUpyNXE0a28/view>.

¹⁷² *Paramount Pictures Corp. v. Axanar Prod’ns, Inc.*, No. 2:15-CV-09938-RGK-E (C.D. Cal. May 9, 2016) (order), *available at* <https://drive.google.com/file/d/0BzmetJxi-p0VN0t5MWNPOTZ4SU0/view>.

¹⁷³ *Paramount*, 2017 WL 83506, at *4–*10.

¹⁷⁴ *Id.* at *4–*5.

¹⁷⁵ The opinion’s full statement is as follows:

The evidence [submitted by Paramount and CBS] also includes settings from the Star Trek Copyrighted Works such as planets Axanar, Qo’noS, and Vulcan (including a shot of Vulcan from *Star Trek III: The Search for Spock*); military spaceships including Klingon battlecruisers, Vulcan ships with an engine ring, and Federation spaceships with their iconic saucer-shaped hull (e.g., the U.S.S. Enterprise), space travel elements such as spacedocks, and Vulcan buildings—cathedrals with sword-blade-shaped domes. The evidence further describes plot points, sequence of events, and dialogs from the Star Trek Copyrighted Works such as the Federation, the Klingon Empire, and conflicts between the two in the Four Years War at the Battle of Axanar (which is also described in a Paramount-licensed game including a supplement titled *Four Years War*, the Vulcan council, the teachings of Vulcan philosopher Surak, the use of the Federation logo, stardate, transporters and warp drive, weapons such as phasers and photon torpedoes, and the Klingon language. Finally, the evidence describes mood and theme of the Star Trek Copyrighted Works as science fiction action adventure, specifically a military space drama.

Id. at *5 (record references omitted).

copyrightable, stating, “Although each of these elements may not be individually original and copyright protectable, they are ‘numerous enough and their selection and arrangement original enough that their combination constitutes an original work of authorship,’ especially when combined with the costumes and fictional characters and species, examples of which are described above.”¹⁷⁶ The case was eventually settled, with Axanar accepting a license for its preexisting twenty-minute work and pledging to adhere to Paramount’s new publicly stated policy of withholding any objections to fan films that last fifteen minutes or consist no more than two segments totaling thirty minutes or less.¹⁷⁷

2. Auxiliary Languages

Auxiliary languages (auxlangs) are intended to provide a common basis for communication for people from different language traditions. International auxiliary languages (IAL) aspire to be used by everyone. The first IAL to gain widespread use was Volapük, which was first described in 1879 and published as a book in 1880.¹⁷⁸ Volapük was superseded by the publication of Esperanto in 1887,¹⁷⁹ which after passing through some doldrums is enjoying a modest revival.¹⁸⁰ The International Auxiliary Language Association (IALA) was established in 1924 to promote IALs, creating its own language, Interlingua, in 1951.¹⁸¹ After IALA closed its

¹⁷⁶ *Id.* (quoting *Satava v. Lowry*, 323 F.3d 805, 811 (9th Cir. 2003)).

¹⁷⁷ Alec Peters, *Lawsuit Settlement Announced!*, AXANAR (Jan. 20, 2017), <https://axanarproductions.com/9707-2/>. For Star Trek’s guidelines for fan films, see *Fan Films*, STAR TREK, <http://www.startrek.com/fan-films> (last visited January 26, 2019).

¹⁷⁸ JOHANN MARTIN SCHLEYER, VOLAPÜK: DIE WELTSPRACHE; ENTWURF EINER UNIVERSALSPRACHE FÜR ALLE GEBILDETE DER GANZEN WELT [VOLAPÜK: THE WORLD LANGUAGE: DRAFT OF A UNIVERSAL LANGUAGE FOR ALL EDUCATED PEOPLE ALL OVER THE WORLD] (Reinhard Haupenthal ed., Olms 1982) (1880).

¹⁷⁹ LUDOVIC LAZARUS ZAMENHOF, DR. ESPERANTO’S INTERNATIONAL LANGUAGE (R.H. Geoghegan trans., 1889) (Verkista 2000) (English translation of pamphlet first published in Russian in 1887).

¹⁸⁰ Federico Gobbo, *Coolification and Language Vitality: The Case of Esperanto*, 6 LANGUAGES 93 (2021).

¹⁸¹ INT’L AUXILIARY LANGUAGE ASS’N, INTERLINGUA-ENGLISH: A DICTIONARY OF THE INTERNATIONAL LANGUAGE (Alexander Gode, ed., 1951).

doors in 1953, the newly created Interlingua Division of Society of the Science Service took over responsibility for promoting the language until 1966.¹⁸²

Other auxiliary languages are described as regional or zonal, in that they are intended to be spoken on a regional rather than a global scale. Prominent examples include pan-Slavic Interslavic, Germanic-based Tutonish, and African-based Afrihili.¹⁸³ A particularly interesting example for purposes of this Article is *palawa kani*, which is an attempt by the Tasmanian Aboriginal Center (TAC) to synthesize a coherent language out of fragments of twelve extinct indigenous languages.¹⁸⁴

Auxiliary languages have not given rise to many copyright disputes. As a result, courts have not occasion to address their copyrightability. Learned Hand did refer to Esperanto when denying copyright protection to a list of 6,235 coined words that had no ascribed meaning.¹⁸⁵ The uncopyrightability of a list of words or symbols that the author had not given any meaning says nothing about constructed languages, which have full vocabularies and grammar. At least one court expressed skepticism regarding claims that constructed languages such as Esperanto are uncopyrightable, calling such arguments “vulnerable” and “depend[ent] on arbitrary definitions of words, adopted for undisclosed reasons” that border on “word games.”¹⁸⁶

In the absence of clear guidance, creators of constructed languages have followed a variety of practices. The desire to have them widely spoken often leads authors to permit broad

¹⁸² FRANK J. ESTERHILL, INTERLINGUA INSTITUTE: A HISTORY 19, 23 (2000).

¹⁸³ Alan Reed Libert, *Artificial Languages*, in OXFORD RESEARCH ENCYCLOPEDIA OF LINGUISTICS (June 25, 2018), <https://doi-org.proxy.library.upenn.edu/10.1093/acrefore/9780199384655.013.11>.

¹⁸⁴ Christopher D. Berk, *Palawa Kani and the Value of Language in Aboriginal Tasmania*, 87 OCEANIA 2 (2017).

¹⁸⁵ *Reiss v. Nat'l Quotation Bur.*, 276 F.717, 718 (S.D.N.Y. 1921).

¹⁸⁶ *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 72 (D. Mass. 1990).

use and sometimes even consign them to the public domain.¹⁸⁷ For example, Esperanto’s creator, L.L. Zamenhof, announced that Esperanto is the “property of society, and the author renounces all personal rights in it forever.”¹⁸⁸

At the same time, some creators of auxiliary languages have attempted to use copyright to protect their creations. For example, the Wikimedia Foundation’s 2014 Transparency Report revealed that Wikipedia had refused the Tasmanian Aboriginal Centre’s request to take down its article on *palawa kani* “because copyright law simply cannot be used to stop people from using an entire language or to prevent general discussion about the language. Such a broad claim would have chilled free speech and negatively impacted research, education, and public discourse — activities that Wikimedia serves to promote.”¹⁸⁹ Interestingly, the Centre’s claims may not be based exclusively on copyright.¹⁹⁰ Filings to the Australian legislature mention a wide range of international treaties and conventions on indigenous rights.¹⁹¹ The Centre discourages nonaborigines from speaking the language until the aborigines become competent in it.

¹⁸⁷ *Welcome*, LÁADAN LANGUAGE. <https://laadanlanguage.com/> (last visited Aug. 16, 2021).

¹⁸⁸ LUDOVIC LAZARUS ZAMENHOF, DR. ESPERANTO’S INTERNATIONAL LANGUAGE (R.H. Geoghegan trans., 1889) (Verkista 2000) (“An international language, like every national one, is the property of society, and the author renounces all personal rights in it forever.”), available at http://www.genekeyes.com/Dr_Esperanto_html.

¹⁸⁹ *Wikimedia Foundation Transparency Report/2014/Requests for Content Alteration & Takedown*, WIKIPEDIA META-WIKI (Oct 5, 2014, 3:44), https://meta.wikimedia.org/wiki/Wikimedia_Foundation_Transparency_Report/2014/Requests_for_Content_Alteration_%26_Takedown.

¹⁹⁰ Berk, *supra* note 184, at 12 (recognizing that the Tasmanian community had asserted ownership over *palawa kani* limiting to uses that benefit the Aboriginal community through means “shot of a formal copyright”).

¹⁹¹ Article 5(1) of the UNESCO Convention Against Discrimination in Education 1960, Article 30 of the Convention on the Rights of the Child, International Covenant on Economic, Social and Cultural Rights in 1972, Article 8, 13, 14, and 39 of the Declaration on the Rights of Indigenous Peoples. Submission to House Standing Committee on Aboriginal and Torres Strait Islander Affairs Inquiry into Language Learning in Indigenous Communities by the Tasmanian Aboriginal Centre Inc., Submission No. 144, https://www.aph.gov.au/Parliamentary_Business/Committees/House_of_representatives_Committees?url=/atsia/languages2/subs/sub144.pdf.

3. Engineered Languages

Once called research, experimental, or philosophical languages, *engineered languages* (engelang) are constructed languages designed to satisfy specific objective criteria. A fairly new arrival is *Toki Pona*, created by Sonja Lang in 2001¹⁹² that embodies Taoism by reducing complexity and embracing minimalism by using simple sounds and roughly 120 words.¹⁹³ Consistent with the Sapir-Whorf hypothesis, *Toki Pona* attempts to immerse people in the moment and to induce positive thinking by using positive words.¹⁹⁴ In fact, Lang devised *Toki Pona* to help her deal with depression.¹⁹⁵

Other engineered languages are constructed to embody certain logical principles with intention of making language more precise. A particularly interesting example for the purposes of this Article is Loglan, which sociologist James Cooke Brown created in 1955 in order to conduct a real-world test of the Sapir-Whorf hypothesis itself. Specifically, he designed the language based on the principles of predicate logic in order to see if the structure of the language shaped the way its speakers think.¹⁹⁶

¹⁹² The language first appeared on www.tokipona.org in 2001. Marek Blahuš, *Toki Pona: eine minimalistische Plansprache* [Toki Pona: A minimalist constructed language], 18 INTERLINGUISTISCHE INFORMATIONEN 51, 51 (2011); Renato Fabbri, *Basic Concepts and Tools of the Toki Pona Minimal and Constructed Language*, ARXIV.ORG (July 4, 2018), <https://arxiv.org/abs/1712.09359>. Lang now has produced at least two authoritative texts. SONJA LANG, *TOKI PONA: THE LANGUAGE OF GOOD* (2014); SONJA LANG, *THE TOKI PONA DICTIONARY* (2021).

¹⁹³ Blahuš, *supra* note 192, at 51; Zach Tomaszewski, *A Formal Grammar for Toki Pona* (2012), available at <https://www2.hawaii.edu/~chin/661F12/Projects/ztomaszewski.pdf>; Amber Dance, *Babel's modern architects*, L.A. TIMES (Aug. 24, 2007, 12:00 AM PT), <https://www.latimes.com/archives/la-xpm-2007-aug-24-sci-conlang24-story.html>.

¹⁹⁴ Blahuš, *supra* note 192, at 54; Dance, *supra* note 193; Roc Marin, *How to Say (Almost) Everything in a Hundred-Word Language*, ATLANTIC (July 15, 2015), <https://www.theatlantic.com/technology/archive/2015/07/toki-pona-smallest-language/398363/>; Siobhan Roberts, *Canadian has people talking about lingo she created*, GLOBE & MAIL (July 9, 2007), <https://www.theglobeandmail.com/technology/canadian-has-people-talking-about-lingo-she-created/article20399052/>.

¹⁹⁵ Dance, *supra* note 193; Roberts, *supra* note 194.

¹⁹⁶ James Cooke Brown. *Loglan*, SCI. AM., June 1960, at 53, 55.

These categories are not always mutually exclusive. Many constructed languages span more than one category. For example, Suzette Haden Elgin created Láadan both as an artistic language as part of the *Native Tongue* series of novels as well as an engineered language designed both to express the perceptions of women and to test the Sapir-Whorf hypothesis.¹⁹⁷

Engineered languages have given rise to occasional legal disputes. For example, tensions began to flare with respect to Loglan during the 1980s, mostly out of frustration with the slow pace with which Loglan's creator, James Cooke Brown, was developing the language. These tensions erupted into an outright schism when Brown responded to Robert LeChevalier's creation of computer flashcards to help study the language by demanding that LeChevalier sign a statement acknowledging that Brown held the copyright in Loglan and pay Brown royalties to use it.¹⁹⁸ In March 1987, Brown eventually sent LeChevalier a cease and desist letter asserting that use of the term Loglan violated Brown's trademark. The courts would eventually uphold the Patent and Trademark Office Trademark Trial and Appeal Board's refusal to register the trademark on the grounds that Loglan represented the generic name for a language.¹⁹⁹

B. The Implications of the Linguistic Relativity Debate

The literature exploring the copyrightability of constructed languages is vanishingly thin, consisting of one student note,²⁰⁰ a magazine article published by the ABA Section Intellectual Property Law,²⁰¹ and two memorandum opinions prepared by private attorneys for the

¹⁹⁷ Kristine Anderson, *To Utopia Via the Sapir-Whorf Hypothesis: Elgin's Láadan*, 3 UTOPIAN STUD. 92, 92 (1991)..

¹⁹⁸ ARIKA OKRENT, IN THE LAND OF INVESTED LANGUAGES 224 (2009).

¹⁹⁹ *Loglan Inst., Inc. v. Logical Language Group, Inc.*, 962 F.2d 1038 (Fed. Cir. 19912).

²⁰⁰ Adelman, *supra* note 14.

²⁰¹ Joshua L. Simmons & Megan L. McKeown, *Contentious Construction*, LANDSLIDE, July/Aug. 2017, at 44, available at <https://ssrn.com/abstract=3012666>.

constructed language community.²⁰² These commentaries conducted their analysis by applying conventional doctrinal categories such as originality, fixation, the idea-expression dichotomy, functionality, and fair use. The only mention of linguistic relativity is a passing reference during the description of Loglan’s origins that contained no analysis of the theory.²⁰³ The omission is unfortunate because the debate over linguistic relativity has clear implications for the copyrightability of constructed languages.

1. Universal Grammar

Consider first universal grammar, which contends that all languages follow the same innate structure. It has limited, but important, implications for the copyrightability of constructed languages. If correct, universal grammar suggests that permitting authors to copyright a constructed language poses no problem unless the protection includes the universal structure that all languages must follow. Note that even this claim does not necessarily mean that constructed languages cannot enjoy any copyright protection whatsoever. Universal grammar applies only a language’s structural elements and appears to omit nonstructural aspects. Copyrighting other aspects of a language thus pose no conceptual problems.

Moreover, as noted earlier, universal grammar’s proponents have struggled to articulate a principled basis for determining what lies within the core of a language as opposed to the periphery and which linguistic elements constitute part of Chomsky’s Minimalist Program.²⁰⁴ The difficulties surrounding how to locate the boundary between the core and the periphery are

²⁰² Legal Opinion by Robert Wade, *supra* note 163; Memorandum from Dentons US LLP to the Language Creation Society 1–5 (Oct. 21, 2014), *available at* <http://conlang.org/cms/wp-content/uploads/Dentons-Conlang-Memo-public-version.pdf>.

²⁰³ Adelman, *supra* note 14, at 548.

²⁰⁴ *See supra* notes 124–129 and accompanying text.

reminiscent of Judge Learned Hand’s observation about levels of generality in *Nichols v.*

Universal Pictures Corp.:

Upon any work, and especially upon a play, a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may be no more than the most general statement of what the play is about, and at times might only consist of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his “ideas,” to which, apart from their expression, his property is never extended.²⁰⁵

At one level of generality, both of the plays at issue in that case were similarly about a young Irish man and a young Jewish woman who become estranged from their families after they secretly wed, only to become reconciled later.²⁰⁶ At another level of generality, the plays are quite different in terms of the role of religion, the device through which reconciliation occurs, and the characterization of the fathers.²⁰⁷ Whether the second play infringes the first depends on the level of generality used to define what is the essence of each. Unfortunately, “[n]obody has ever been able to fix that boundary [between idea and expression], and nobody ever can.”²⁰⁸

The theory of universal grammar offers an analytical framework that can provide some traction on this question. Elements that reside in the core identified by the Minimalist Program clearly belong on the idea side of the dichotomy. This framework does not provide a complete solution, since there are many statements are properly regarded as falling within the province of ideas instead of expression even though they are not language structure.

²⁰⁵ 45 F.2d 119, 121 (2d Cir. 1930).

²⁰⁶ *Id.* at 120–21.

²⁰⁷ *Id.* at 122.

²⁰⁸ 45 F.2d 119, 121 (2d Cir. 1930).

2. Linguistic Relativity

Linguistic relativity provides greater insight, militating in favor of imposing greater limits on the copyrightability of constructed languages. The Supreme Court has recognized that “choices as to selection and arrangement, so long as they are made independently by the compiler and entail a minimal degree of creativity” may merit copyright protection even if the components combined together are uncopyrightable.²⁰⁹ As the Second Circuit has noted, “Every kind of work at some level is . . . an arrangement of uncopyrightable ‘common elements.’ No individual word is copyrightable, but the arrangement of words into a book is. No color is copyrightable, but the arrangement of colors on canvas is.”²¹⁰ The Seventh Circuit similarly upheld the copyrightability of certain greeting cards even though they were composed of elements that were not separately copyrightable.²¹¹ The court held that although elements such as size, color, paper, ink border design, stripes, ellipses, and single-sided format “are not individually capable of protection, just as individual words do not deserve copyright protection, it is the unique combination of these common elements which form the copyrighted material.”²¹² Other judicial decisions concur,²¹³ as does the guidance issued by the Copyright Office.²¹⁴ That said, the scope of copyright protection is “thin,” covering only the originality associated with the

²⁰⁹ Feist Public’ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 349 (1991).

²¹⁰ Zaleski v. Cicero Builder Dev., Inc., 754 F.3d 95, 103–04 (2d Cir. 2014) (citation omitted).

²¹¹ Roulo v. Russ Berrie & Co., 886 F.2d 931 (7th Cir. 1989).

²¹² *Id.* at 939.

²¹³ *See, e.g.*, Keeling v. Hars, 809 F.3d 43, 50–51 (2d Cir. 2015); Satava v. Lowry, 323 F.3d 805, 811 (9th Cir. 2003); Sem-Torq, Inc. v. K Mart Corp., 936 F.2d 851, 855 (6th Cir. 1991); Harper House, Inc. v. Thomas Nelson, Inc., 889 F.2d 197, 205 (9th Cir. 1989); Home Legend, LLC v. Mannington Mills, Inc., 784 F.3d 1404, 1411 (11th Cir. 2015).

²¹⁴ U.S. Copyright Office, Compendium of U.S. Copyright Office Practices § 313, at 20 (3d ed. 2014), <https://www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf>; Registration of Claims to Copyright Notice of Inquiry: Colorization of Motion Pictures, 51 Fed. Reg. 32,665, 32,666 (Sept. 15, 1986).

selection and arrangement of the uncopyrightable elements and not the uncopyrightable elements themselves.²¹⁵

Consider the ordering of the three principal parts of a sentence: subject (S), verb (V), and object (O). Simple mathematics reveals that there six possible orders in which to put these three elements.²¹⁶ With such a limited set of possibilities, giving any author copyright protection in one of them would be problematic. However, not all six occur with equal frequency among natural languages. A 2016 survey of 5,252 languages found the following frequencies for each pattern: SOV 43.3%, SVO 40.3%, VSO 9.5%, VOS 3.3%, OVS 0.7%, and OSV 0.3%.²¹⁷

Earlier studies identified similar patterns.²¹⁸

The creator of Klingon deliberately chose the OVS pattern and sounds that rarely occur in natural languages in order to make them sound more alien.²¹⁹ The sound combinations also made the language sound harsher, consistent with the characterization of Klingon culture as bellicose and jingoistic.²²⁰ Individually, the features may be uncopyrightable, but the combination of these elements may be sufficiently creative to be copyrightable. In the words of

²¹⁵ *Feist*, 499 U.S. at 349.

²¹⁶ The number of possible permutations is 3!, which equals 6.

²¹⁷ Harald Hammarström, *Linguistic Diversity and Language Evolution*, 1 J. LANGUAGE EVOLUTION 19, 25 (2016). Grouping languages by families skewed the distribution even more heavily toward SOV. *Id.*

²¹⁸ Joseph H. Greenberg, *Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements*, in UNIVERSALS OF LANGUAGE 73, 76–77, 107–08 (2d ed., Joseph H. Greenberg ed., 1963); GRAHAM MALLISON & BARRY J. BLAKE, LANGUAGE TYPOLOGY: CROSSLINGUISTIC STUDIES IN SYNTAX 226 (1981); MERRITT RUHLEN, A GUIDE TO THE LANGUAGES OF THE WORLD _ (1975); RUSSELL S. TOMLIN, BASIC WORD ORDER: FUNCTIONAL PRINCIPLES 22 (1986); Russell Ultan, *Some General Characteristics of Interrogative Systems*, in 4 UNIVERSALS OF HUMAN LANGUAGE: SYNTAX 211, _ (Joseph H. Greenberg ed., 1978).

²¹⁹ Marc Okrand et al., “*Wild and Whirling Words*”: *The Invention and Use of Klingon*, in FROM ELVISH TO KLINGON: EXPLORING INVENTED LANGUAGES 111, 116–19 (Michael Adams ed., 2011).

²²⁰ P. Stockwell, *Invented Language in Literature*, in ENCYCLOPEDIA OF LANGUAGE & LINGUISTICS 3, 6 (2d ed., Keith Brown ed., 2006); Harley J. Sims, *Review*, 30 MYTHLORE 159, 163 (2012).

Klingon’s creator, Marc Okrand, “There is no sound in Klingon the does not occur in any number of natural languages, but the particularly inventory of sounds is unique to Klingon.”²²¹

Linguistic relativity introduces an additional consideration by implying that the saliences and resistances embedded in a language’s structure makes certain concepts more memorable and filters the way they perceive the world. If so, language structures become deeply functional and fall closer to the idea side of the idea-expression dichotomy. The connection between language structure and thought may in fact cause the two to merge and thus lose copyright protection, because giving authors of constructed languages the exclusivity over a particular structure risks giving those authors de facto control over how to induce a particular pattern of thought.

In this sense, linguistic relativity also has the potential to add the type of substantive content to the idea-expression dichotomy that Learned Hand thought was unattainable. At the same time, it threatens to undermine the Supreme Court’s reliance on the independence between language and ideas deemed essential to justifying copyright protection, at least with respect to the structure of a constructed language.²²²

3. Differences Among Types of Constructed Languages

In addition, different types of constructed languages naturally implicate the concerns of copyright in different ways. For example, structural choices for artistic languages are likely to be driven by expressive considerations. More functional works are less inherently expressive.²²³

²²¹ Okrand, *supra* note 219, at 117.

²²² *See supra* note 2 and accompanying text.

²²³ *See* Google LLC v. Oracle Am., Inc., 141 S. Ct. 1183, 1198 (2021) (distinguishing functional works, such as computer programs, from “books, films, and many other ‘literary works’”).

For example, engineered languages tend to be primarily functional, as they are designed to achieve some particular end.²²⁴

Auxiliary languages are less susceptible to broad generalizations. Consider first IALs, whose primary purpose is to provide all people with a common basis for communication. As such, they are often regarded to be driven more by pragmatism than by commitment to strong conceptual principles.²²⁵

Interestingly, each of the key figures in the debate over linguistic relatively have offered their views of IALs, adopting strikingly divergent positions. Chomsky did not address IALs in his published, but he has discussed them in interviews. Although Chomsky's belief in a universal grammar might have led him to support the creation of a single language that all people could speak,²²⁶ his belief in language as a biological phenomenon led him to reject the idea that any true language can be constructed.²²⁷ Because it is a natural phenomenon, language can best be (and perhaps only be) understood studying existing languages.²²⁸ This led him to dismiss "the concept of inventing a language" as "very misleading"²²⁹ and why he claimed Esperanto was not a language and instead involved only "the invention of extremely superficial elements of language."²³⁰ In addition, he regarded the desire for a universal language as being "based on an

²²⁴ See *supra* Part II.A.3. As noted earlier, some constructed languages can be both artistic and engineered. See *supra* note 197 and accompanying text.

²²⁵ Edward Sapir, *The Function of an International Auxiliary Language*, 11 *PSYCHE* 4. [2] (1931).

²²⁶ Yanabu Akira & Indra Levy, *In the Beginning, There Was the Word*, 20 *REV. JAPANESE CULTURE & SOC'Y* 246, 249 (2008).

²²⁷ Jens Stengaard Larsen, *How could Noam Chomsky say that Esperanto is not a language?*, QUORA (Apr. 27, 2016), <https://www.quora.com/How-could-Noam-Chomsky-say-that-Esperanto-is-not-a-language/answer/Jens-Stengaard-Larsen>.

²²⁸ *Faculty Forum Online: A Conversation with Noam Chomsky*, YOUTUBE (Jan. 15, 2015), <https://www.youtube.com/watch?v=HZVxcoS1etE> (beginning at 19:57).

²²⁹ *Id.*

²³⁰ "Chomsky on Linguistics": *Stony Brook Interview #2 with Mark Aronoff*, YOUTUBE (July 10, 2018), <https://www.youtube.com/watch?v=C09jMAH6X18> (beginning at 20:31).

illusion.”²³¹ The need for subject matter to study made it “more efficient to have . . . a whole lot of languages” than to teach a “parasitic” system that simplifies other languages.²³² Since all natural languages are simply dialects of the one universal human grammar, and there is no reason to prefer one over another.²³³

The implications of linguistic relativity are less clear. Whorf shared Chomsky’s antagonism toward IALs, but for very different reasons. Whereas for Chomsky the existence of an inherent universal language made the differences embodied in natural languages nothing more than superficial variations of no particular significance, Whorf thought that differences across languages were essential attributes that must be preserved. Indeed, he “believe[d] that those who envision a future world speaking only one tongue . . . hold a misguided ideal and would do the evolution of the human mind the greatest disservice.”²³⁴ “The only correctives” to the hegemony of the point of view inherent in the structure of Western languages “lie in all those other tongues which by aeons of independent evolution have arrived at different, but equally logical, provisional analyses.” Thus, the nontranslatability of languages represented not just a barrier to the construction of a single, universal language; it signals an important source of the diversity of thought that IALs would homogenize. Whorf’s view that languages are tied to culture and are inherently untranslatable necessarily entails that, in the words of one commentator, “there is no chance to construct one, universal language.”²³⁵

²³¹ *Id.*

²³² *Id.*

²³³ Larsen, *supra* note 227.

²³⁴ Benjamin Lee Whorf, *Languages and Logic*, 43 *TECH. REV.* 250, 272 (1941), available at <https://archive.org/details/MIT-Technology-Review-1941-04/page/n19/>, reprinted in *FOUR ARTICLES ON METALINGUISTICS* 17, 23 (1951), and *LANGUAGES, THOUGHT, AND REALITY: SELECTED WRITINGS OF BENJAMIN LEE WHORF* 233, 244 (John B. Carroll ed., 1956).

²³⁵ Emanuel Kulczycki, *Edward Sapir’s View About International Auxiliary Languages*, 18 *LINGUA AC COMMUNITAS* 65, 68 (2008).

Sapir, in contrast, adopted a much more sanguine stance toward IALs. As noted earlier, Sapir saw a looser connection between linguistic structure and thought than did Whorf.²³⁶ This distance led Sapir to accommodate IALs to an extent Whorf could not. Sapir backed his academic rhetoric with action. He played an active role in shaping the research program of the International Auxiliary Language Association.²³⁷ In addition to authoring a key memorandum on IALs in 1925,²³⁸ he also took a three-month sabbatical to conduct research for IALA in 1929, served as IALA's first Research Director from 1930-31, and served on its Advisory Board for Linguistic Research from 1927 until his death in 1939.²³⁹

Sapir's support for IALs was also manifest in his scholarly writings. In his 1931 article on "The Function of an International Auxiliary Language," Sapir emphasized the unquestioned "theoretical desirability" and "logical necessity" of IALs.²⁴⁰ Not only would adoption of an IAL avoid the "necessary evil" of the costs associated with translation and impaired comprehension; the growing demands of modernity require a language that does more than "merely extend[] the imperfections and provincialism" of prior languages and would instead incorporate a greater degree of logic, richness, and creativity than any of its predecessors.²⁴¹ If successful, the resulting IAL would provide a "broad base for every type of international understanding . . . for every type of expression of the human spirit which is of more than local interest."²⁴² His entry on "Language" in the 1933 *Encyclopedia of the Social Sciences*, sounded similar themes, calling

²³⁶ See *supra* note 27 and accompanying text.

²³⁷ On Sapir's early involvement in IALA, see Julia S. Falk, *Words Without Grammar, Linguists and the International Auxiliary Language Movement in the United States*, 15 LANGUAGE & COMMUN 241, 244-52 (1995).

²³⁸ Edward Sapir et al., *Memorandum on the Problem of an International Auxiliary Language*, 16 ROMANIC REV. 244 (1925). Although four other linguists cosigned the document, the work was Sapir's. Falk, *supra* note 237, at 245.

²³⁹ Falk, *supra* note 237, at 247, 249, 251, 258.

²⁴⁰ Sapir, *supra* 225, at [1, 2].

²⁴¹ *Id.* at [1-2, 3, 5].

²⁴² *Id.* at [2].

IALs a “logical necessity . . . in modern times” and criticizing claims of “the supposed artificiality” of Esperanto and other IALs as “absurdly exaggerated.”²⁴³ He saw less promise in zonal languages, predicting that attempts to revive regional languages would fail in the face of burgeoning internationalism.²⁴⁴

Sapir and Whorf thus differed on IALs. While Sapir regarded them as very promising, Whorf derided them as an unfortunate attempt that would homogenize thought along Western lines. While clearly averse toward the universality of IALs, Whorf did not clarify whether he thought that zonal auxiliary languages provide sufficient variation to support innovations in thought.

Constructed languages serve values beyond the goals of serving as an outlet for creative expression, pragmatically supporting international communication, and promoting logical thinking.²⁴⁵ IALs are often said to support substantive goals as well. For example, Sapir noted providing the entire world with a common basis for communication would serve as “one of the most potent symbols of the freedom of the human spirit that the world has yet known.”²⁴⁶ He predicted that, despite the growing importance of language as a symbol of cultural difference and sovereignty, attempts by minority populations to revive regional languages would likely fail in the face of burgeoning embrace of internationalism.²⁴⁷

Esperanto has become “associated with an almost mystical humanism” centered on the belief that adoption of a common language will reduce conflict and promote understanding,

²⁴³ Edward Sapir, *Language*, in 9 *ENCYCLOPEDIA OF THE SOCIAL SCIENCES* 155, 168 (Alvin Johnson & Edwin R.A. Seligman eds., 1933).

²⁴⁴ *Id.* at 167–68.

²⁴⁵ JANTON, *supra* note 153, at 18, 27, 33–34, 37.

²⁴⁶ Sapir, *supra* note 225, at [2, 6].

²⁴⁷ Edward Sapir, *Language*, in 9 *ENCYCLOPEDIA OF THE SOCIAL SCIENCES* 155, 167–68 (Alvin Johnson & Edwin R.A. Seligman eds., 1933).

despite attempts in some quarters for it to remain ideologically neutral.²⁴⁸ For example, L.L. Zamenhof’s foundational pamphlet that launched Esperanto rejected “see[ing] Esperanto [as] just a practical affair.”²⁴⁹ Instead of “fear[ing] offending those people who want to use Esperanto only for practical purposes,” he embraced “the sacred, grand and important idea that an international language contains itself . . . brotherhood and justice among all peoples,”²⁵⁰ themes that Zamenhof would reiterate in his later speeches and writings.²⁵¹ Whether it was because of the language itself or because of Zamenhof’s charismatic vision, the community of Esperanto speakers has developed into a movement committed to Zamenhof’s values including “pacifism, antimilitarism, internationalism, [and] predominantly left-leaning and progressive causes.”²⁵² The depth of the accession of these values is demonstrated tragically by Esperantists’ persecution by Hitler and Stalin.²⁵³

Zonal auxiliary languages embody values that overlap the internationalist and universalist commitments associated with IALs. Part of the motivation for pursuing zonal constructed languages is pragmatic: a common language is easier to create and to learn when the speakers’

²⁴⁸ *Id.* at 27–31, 34–38; accord Nenad Knežević, *Constructed Languages in the Whirlwind of the Digital Revolution*, in LANGUAGE, LITERATURE AND TECHNOLOGY 9, 12 (Artea Panajotović et al. eds., 2018) (Proc. 6th Int’l Conf. at the Faculty of Foreign Languages)..

²⁴⁹ L.L. ZAMENHOF, DR. ESPERANTO’S INTERNATIONAL LANGUAGE: INTRODUCTION & COMPLETE GRAMMAR (R.H. Geoghegan trans., Gene Keyes ed., Verkista 2000) (1889) (English translation of work originally published in Russian on July 26, 1887), available at https://www.genekeyes.com/Dr_Esperanto.html.

²⁵⁰ *Id.* at 371–72.

²⁵¹ JANTON, *supra* note 153, at 28–31.

²⁵² Knežević, *supra* note 248, at 12–14; accord PETER GLOVER FORSTER, THE ESPERANTO MOVEMENT 272 (1982); ALEKSANDER KRZHENKOV, ZAMENHOF; THE LIFE, WORKS AND IDEAS OF THE AUTHOR OF ESPERANTO 5, 68–73, 74–77, 81–82 (2010); ANDREW LARGE, THE ARTIFICIAL LANGUAGE MOVEMENT 126–30 (1985); Gobbo, *supra* note 180, at 3; Frank Nuessel, *The Symbolic Nature of Esperanto*, 109 SEMIOTICA 369, 370, 374 (1993) (reviewing JANTON, *supra* note 153).

²⁵³ ULRICH LINS, DANGEROUS LANGUAGE – ESPERANTO UNDER HITLER AND STALIN (2016).

native tongues belong to the same language family.²⁵⁴ With respect to substantive values, some are quite similar to those espoused by IALs, such as greater participation in transnational e-democracy and support for computer translation.²⁵⁵

But proponents of zonal auxiliary languages advance them for other reasons that are quite different from those associated with IALs. Some proponents see zonal auxiliary languages as a defense against the effect that the growing hegemony of English is having on other cultures.²⁵⁶ Others regard them in more affirmatively constitutive terms, seeing them as a means to promote a sense of ethnicity²⁵⁷ in a manner similar to revitalized languages, such as Hebrew, Irish, Cornish, Hawaiian, Māori, and Welsh.²⁵⁸ Zonal auxiliary languages may thus represent a potential revival of the Romantic nationalism that characterized the 19th Century.²⁵⁹ In the case

²⁵⁴ Maria Kocór et al., *Zonal Constructed Language and Education Support of e-Democracy – The Interslavic Experiment*, in *E-DEMOCRACY – PRIVACY-PRESERVING, SECURE, INTELLIGENT E-GOVERNMENT SERVICES* 15, 21 (Sokratis K. Katsikas & Vasilos Zorkadis eds., 2017).

²⁵⁵ Maria Kocór et al., *Zonal Constructed Language and Education Support of e-Democracy – The Interslavic Experiment*, in *E-DEMOCRACY – PRIVACY-PRESERVING, SECURE, INTELLIGENT E-GOVERNMENT SERVICES* 15 (Sokratis K. Katsikas & Vasilos Zorkadis eds., 2017) (Proc. 7th Int'l Conf. E-Democracy 2017). Because zonal constructed languages would only have regional acceptance, any use in promoting e-democracy would require acceptance of the language by other countries and institutions participating in the e-democratic process.

²⁵⁶ Vojtěch Merunka et al., *Novslava lingvo: Konstruado de zonaj lingvoj: defio, sperto kaj oportuno por la dudek-unua jarcento* [*Neoslavonic language: Building zonal languages: challenge, experience and opportunity for the twenty-first century*], in *PRILINGVE EN NITRO: POLITIKE, HISTORIE, TEORIE, INSTRUE: FAKAJ PRELEGOJ PREZENTITAJ KADRE DE LA 101-A UNIVERSALA KONGRESO DE ESPERANTO* [LINGUISTICS IN NITRA: POLITICS, HISTORY, THEORY, EDUCATION: SPECIAL LECTURES PRESENTED AS PART OF THE 101ST UNIVERSAL CONGRESS OF ESPERANTO] 117, (Stanislav Kosecky ed., 2016), available at https://www.researchgate.net/publication/303677293_Neoslavonic_Language_-_Construction_of_zonal_languages_Challenge_experience_opportunity_for_the_21st_century. Interestingly, this argument appeared only in the Esperanto version of this publication; it was omitted from the versions published in English and German venues. Vojtěch Merunka et al., *Neoslavonic language: Zonal Languages Constructing: Challenge, Experience and Opportunity for the 21st Century*, *PROC. 2D INT'L CONF. ON EDUC., LANGUAGE, ART AND INTERCULTURAL COMM. (ICELAIC 2015)* 227 (2016); Vojtěch Merunka et al., *Neoslavonic Language*, 57 *GRUNDLAGENSTUDIEN AUS KYBERNETIK UND GEISTESWISSENSCHAFT* [BASIC STUDIES IN CYBERNETICS AND SPIRITUAL SCIENCE] 114 (2016).

²⁵⁷ Emil Heršak, *Zonal Constructed Language Contacts and Positive Globalisation*, 1 *OPEN J. ANTHROPOLOGICAL STUD.* 1, 3 (2017).

²⁵⁸ Suzanne Romaine, *Revitalized Languages as Invented Languages*, in *FROM ELVISH TO KLINGON*, *supra* note 219, at 185.

²⁵⁹ Knežević, *supra* note 248, at 15; accord Nikolay Kuznetsov, *The Interslavic Language: Way of Communication Among Slavic Nations and Ethnic Groups*, 2 *J. ETHNOPHILOSOPHICAL QUESTIONS & GLOBAL*

of *palawa kani*, its creators hope that its use will build a more cohesive sense of community by fostering a Tasmanian aboriginal way of thinking in the manner envired by linguistic relativity, to the point where they hope to forbid nonaborigines from using the language until it is better established.²⁶⁰ Far from seeking to provide a universal basis for communication, zonal auxiliary languages are necessarily confined to “small, fragmented, often ideologically homogenous groups of speakers, sharing a common standpoint to which the conlang in question has only a secondary, instrumental role.”²⁶¹ Unlike IALs, universal acceptance is not the goal for zonal auxiliary languages. These developments have made “traditional claims of neutrality and universalism” seem “outdated.”²⁶²

Linguistic relativity provides an additional impetus to this goal. Not only would a zonal auxiliary language provide a common basis for communication within this group; speaking a language of the same structure would further build community by inducing them to perceive the world in the same way (although the similarity of the languages within the zone may limit the marginal impact of this effect). Universal grammar would see no such benefit. The existence of a uniform structure that spans all languages would render constructing a shared language a poor tool for constituting smaller communities within the larger society.

The constitutive role to auxiliary languages can have a dark side as well. A 2012 *New Yorker* article described how amateur linguist John Quijada accepted an invitation to and attended a university conference focusing on the engineered language he created known as Ithkuil only to distance himself from that intellectual community out of concerns of having his

ETHICS 18, 19 (2018) (tracing the roots of modern attempts to construct a pan-Slavic language to the pan-Slavism of the 19th Century).

²⁶⁰ Berk, *supra* note 184, at 9, 12–14.

²⁶¹ Knežević, *supra* note 248, at 15

²⁶² *Id.*

language associated with pseudoscience, far-right pan-Slavic nationalism, terrorism, and a potential cult.²⁶³ Authors of other constructed languages have expressed similar misgivings about their lack of control over the languages they created.²⁶⁴

4. Copyright as a Mechanism for Control

Constructed languages thus face a delicate balance. On the one hand, their vitality often depends on their being adopted by a sufficient number of people to maintain viability. This is particularly true for auxiliary languages, whose goal is to increase people's ability to communicate across language boundaries.²⁶⁵ The benefits of scale counsel in favor of removing limits on people's ability to access the language, although these benefits would eventually exhibit diminishing marginal returns and would be less important for artistic languages, whose aesthetic goals are not necessarily closely tied to widescale use.

At the same time, other considerations tilt in favor of allowing creators of constructed languages to exercise a degree of stewardship and control. Some degree of governance may be necessary to give a constructed language the stability and uniformity it needs to thrive. But adoption of a constructed language is voluntary, and participants always remain free to divide the community by starting a variant of their own.²⁶⁶

Consider the example of Esperanto. As questions arose about the optimal rate with which the language should evolve, Esperanto's founder came to believe that promoting the

²⁶³ Foer, *supra* note 54.

²⁶⁴ *See id.* (discussing the unhappiness of the creator of Blissymbolics over the use of his language to teach English to children with cerebral palsy); Dance, *supra* note 193 (describing Lang's discomfort with her lack of control over *Toki Pona*).

²⁶⁵ The need for scale may present particularly thorny challenges for zonal auxiliary languages, because of the natural limitations on the total number of potential speakers.

²⁶⁶ Diego Gonzalez-Rodriguez & Jose Rodolfo Hernandez-Carrion, *Self-Organized Linguistic Systems: From Traditional AI to Bottom-UP Generative Processes*, 103 FUTURES 27-29 (2018).

adoption of Esperanto depended on a degree of stability.²⁶⁷ He therefore took the position that “the foundation of Esperanto must strictly remain absolutely unchanged” until several nations had adopted it.²⁶⁸ A schism eventually erupted when Louis Couturat presented the Delegation for the Adoption of an International Language with a new language based on Esperanto called Ido, which became the first of many offshoots of Esperanto, generally called Esperantidos.²⁶⁹ These have largely faded from the scene while Esperanto has survived, an outcome some attribute in part to the guidance of the Universal Esperanto Association, which has largely resisted calls for significant change.²⁷⁰

Nor was this dynamic unique to Esperanto. Volapük split into two when supporters became frustrated with its creator’s reluctance to expand the language.²⁷¹ Lojban and the Logical Language Institute split from Loglan and the Loglan Institute over disagreements with the creator’s assertions of control.²⁷² The schisms hurt the overall development of the language and divided the number of speakers into smaller groups.²⁷³ Conversely, the leadership of Klingon creator Marc Okrand is generally regarded as having had beneficial effects.²⁷⁴

Similar patterns can be found in open source software projects, which similarly depend on voluntary acceptance by a broad community in order to succeed.²⁷⁵ Many people complain that the existence of too many small changes, each pushed through by an engineer attempting to

²⁶⁷ LARGE, *supra* note 252, at 76.

²⁶⁸ L.L. ZAMENHOF, FUNDAMENTO DE ESPERANTO 43 (1963 ed.); FORSTER, *supra* note 252, at 111.

²⁶⁹ FORSTER, *supra* note 252, at 113–14.

²⁷⁰ Frank Nuessel, *Book Notice*, 59 LANGUAGE 706, 707 (1983).

²⁷¹ OKRENT, *supra* note 198, at 106–07.

²⁷² *Id.* at 226.

²⁷³ See Suzette Haden Elgin, *Can a Language Be Owned?*, in THE LANGUAGE IMPERATIVE: HOW LEARNING LANGUAGES CAN ENRICH YOUR LIFE AND EXPAND YOUR MIND (2000) (describing the problems confronted by Esperanto and Loglan and criticizing the assertion of copyright over constructed languages).

²⁷⁴ The succession plan is less clear. John Lepage, *Review*, 21 TRANSLATION & LIT. 282, 286 (2012).

²⁷⁵ Christopher S. Yoo, *Open Source, Modular Platforms, and the Challenge of Fragmentation*, 1 CRITERION J. ON REG. 619, 633 (2016).

leave a mark on a project, can serve as a major barrier to adoption.²⁷⁶ Open source projects can also fork either because of mismanagement by the current leadership or from a desire to push the project in a different direction.²⁷⁷ The classic example is Unix, which shattered into multiple variants on both the commercial and the academic side.²⁷⁸ Linux, in contrast, has remained unified to date, because of key management reforms and avoidance of personality disputes.²⁷⁹

Such risks are always present for both constructed languages and open source projects. Just as the nature of open source give supporters the right to fork a project, speakers of a language always have the right to begin creating and speaking a different variant of the language.²⁸⁰ The open source solution has been the adoption of a strong norm against forking and reliance on strong central leadership by a so-called “benevolent dictator” or a governing body.²⁸¹ The term, dictator, is a tad misleading: While leaders exercise gatekeeper control in the short run, the community remains free over the long haul to liberate themselves from any strictures imposed if those leaders are not sufficiently responsive to the needs of the community.²⁸²

And sometimes, the desire for control comes not from the need to regulate the rate of change or personal disputes, but rather from a desire to use language to build solidarity within a community, exemplified by *palawa kani*'s attempt to exclude nonaborigines from speaking it.²⁸³ Alternatively, it may implicate personality theory by allowing the constructed language's creator to control the ideas and communities with which it is associated.

²⁷⁶ *Id.* at 629–30.

²⁷⁷ *Id.* at 629.

²⁷⁸ *Id.* at 634–36.

²⁷⁹ *Id.* at 637–39.

²⁸⁰ *Id.* at 633.

²⁸¹ *Id.* at 631.

²⁸² *Id.* at 633.

²⁸³ *See supra* note 260 and accompanying text.

Copyright represents one of the principal means for asserting this type of control, reflected by the Tolkien estate's claim of copyrights in elvish,²⁸⁴ James Cooke Brown's assertions of a copyright in Loglan,²⁸⁵ and the Tasmanian Aboriginal Centers' claim of a copyright in *palawa kani*.²⁸⁶ It is also the device employed by the open source community to protect its values: Rather than consign open source software to the public domain, authors of open source software copyright the code and license it subject to the requirement that any code built from it also be open source.²⁸⁷

To the extent that such concerns have validity, they strengthen arguments for giving constructed languages the benefit of copyright protection. As the example of open source demonstrates, control can be used to ensure that a language remains open as well as to assert exclusive control, if the rightsholder deems that doing so is in their best interest.²⁸⁸ They are likely to be well positioned to act as good stewards so long as their personal interests align with the promoting the success of the constructed language.²⁸⁹

III. LINGUISTIC RELATIVITY AND SOFTWARE

Although the copyrightability of constructed languages is a fascinating topic, the analogous questions around software carry far more practical importance. In terms of copyrightability, the uncertainty that once surrounded whether computer programs were eligible

²⁸⁴ See *supra* notes 159–162 and accompanying text.

²⁸⁵ See *supra* note 198 and accompanying text.

²⁸⁶ See *supra* note 189 and accompanying text.

²⁸⁷ Fabrizio Marrella & Christopher S. Yoo, *Is Open Source the New Lex Mercatoria?*, 47 VA. J. INT'L L. 807, 825 (2007).

²⁸⁸ See Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CALIF. L. REV. 1293 (1996).

²⁸⁹ For the classic argument of such stewardship in the patent context, see Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977).

to receive copyright protection was largely resolved by legislation enacted in 1980.²⁹⁰ The precise scope of that protection is less clear. In one of the most hotly anticipated copyright decisions in quite some time, the Supreme Court had the opportunity to both issues in *Google LLC v. Oracle America, Inc.*²⁹¹ The Court had granted certiorari on the Federal Circuit’s conclusions both that application programming interfaces (APIs) are copyrightable and that copying them did not constitute fair use but chose to dispose of the case on fair use grounds without addressing copyrightability.²⁹²

In terms of copyrightability, courts generally distinguish between copying the actual lines of code (called the “literal elements” of the computer program) and the code’s sequence, structure, and organization (SSO) (called the computer program’s “non-literal elements”).²⁹³ The Supreme Court’s decision not to address copyrightability was unfortunately, as the federal courts of appeals have divided over the copyrightability of SSO, with six circuits holding that

²⁹⁰ 45 F.2d 119, 121 (2d Cir. 1930).

²⁹⁰ *Id.* at 120–21.

²⁹⁰ Government Patent Policy Act of 1980, sec. 10, 94 Stat. 3015, 3028–29 (codified at 17 U.S.C. §§ 101, 117); *see also* *Google LLC v. Oracle Am., Inc.* 141 S. Ct. 1183, 1196, 1198 (2021) (recounting the history of Congress’s deliberations over and resolution of the copyrightability of computer programs).

²⁹¹ 141 S. Ct. 1183 (2021).

²⁹² *Id.* at 1190, 1197.

²⁹³ *Oracle Am., Inc. v. Google, Inc.*, 750 F.3d 1339, 1355–56 (Fed. Cir. 2014) (citing *Comput. Assocs. v. Altai, Inc.*, 982 F.2d 693, 702 (2d Cir. 1992); and *Johnson Controls, Inc. v. Phoenix Control Sys., Inc.*, 886 F.2d 1173, 1175 (9th Cir. 1989); *accord* *MiTek Holdings, Inc. v. Arce Eng’g Co.*, 89 F.3d 1548, 1555 (11th Cir. 1996); *Eng’g Dynamics, Inc. v. Structural Software, Inc.*, 26 F.3d 1335, 1341 (5th Cir. 1994), *supplemented on denial of reh’g*, 46 F.3d 408 (5th Cir. 1995); *Autoskill Inc. v. Nat’l Educ. Support Syss., Inc.*, 994 F.2d 1476, 1495 n.23 (10th Cir. 1993); *Whelan Assocs. Inc. v. Jaslow Dental Lab., Inc.* 797 F.2d 1222, 1248 (3d Cir. 1986); *see also* *Google*, 141 S. Ct. at 1191 (using the phrase SSO with seeming approval).

protection is possible if the selection and arrangement is sufficiently original²⁹⁴ and with one circuit holding that SSO represents an uncopyrightable method of operation.²⁹⁵

An article on the application of linguistic theory is not the appropriate venue for resolving this dispute.²⁹⁶ Instead, my purpose is to examine what light, if any, the debate over linguistic relativity sheds on the protection of a computer program's nonliteral elements. Indeed, its insights into the connection between the structure of language and functionality can guide the assessment of the impact of extending copyright protection to a software package's structural elements.

A. Universal Grammar

At first glance, a theory that asserts the existence of a single universal grammar would seem to be loath to extend copyright protection to SSO. Giving an author exclusive rights over the one possible language structure would be tantamount to giving that author control over the entire function of language.

Closer inspection reveals that such concerns are likely overstated. Recall that universal grammar presumes that human language follows a universal structure that is genetically coded into all people, demonstrated by children's ability to acquire language with minimal exposure to it.²⁹⁷ This rationale does not generalize to software because computers are not limited by the

²⁹⁴ *Oracle*, 750 F.3d at 1348 (citing *Johnson Controls*, 886 F.2d at 1175–76); *Eng'g Dynamics*, 26 F.3d at 1341; *Whelan*, 797 F.2d at 1248; see also *Google*, 141 S. Ct. at 1191 (discussing SSO as part of the aspects of software at issue assumed to be copyrightable); *Applied Innovations, Inc. v. Regents of the Univ. of Minn.*, 876 F.2d 626, 635 (8th Cir. 1989) (citing *Whelan*'s protection of SSO with approval).

²⁹⁵ *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 816 (1st Cir. 1995), *aff'd by an equally divided Court*, 516 U.S. 233 (1996) (mem.); see also *Oracle*, 750 F.3d at 1365–66 (discussion the split between SSO protection and *Lotus*)

²⁹⁶ For a representative range of views, see, e.g., *Special Issue: Software Interface Copyright*, 31 HARV. J.L. & TECH. 303 (2018).²⁹⁷ See *supra* note 65 and accompanying text.

²⁹⁷ See *supra* note 65 and accompanying text.

genetics that govern human beings. The structures that software can adopt are thus not limited to the structures underlying human language, making extending copyright protection to a software package's SSO less problematic.

B. Linguistic Relativity

SSO copyrights raise greater concerns under linguistic relativity. The central claim of the Sapir-Whorf hypothesis is that language structures shape the way people perceive the world by making certain aspects mandatory and more salient while deemphasizing others. Although the mechanism that linguistic relativity envisions is a matter of human cognition, it has a direct analogue in software design. Software was once created as a single, integrated whole, but over time software architects found it convenient to break larger programs down into smaller subroutines.²⁹⁸

Subroutines require a predefined interface that other programs can use to call upon their services. For example, software packages must typically know the name of the subroutine, the content and format of the inputs the subroutine needs to perform its functions, and the content and format of the subroutine's output.²⁹⁹ To use the example cited in *Google v. Oracle*, a subroutine called **max** that determines which of two integers (in this case **4** and **6**) is larger could be called through the subroutine call **max(4,6)** and be expected to return the number **6**. Note that more complex subroutines also need rules on how to respond to unusual situations, such as incomplete data, improper syntax, parameters that fall outside the range of expected values.³⁰⁰

For example, anyone with even minimal experience using the World Wide Web knows that

²⁹⁸ Vinton G. Cerf, *APIs, Standards, and Enabling Infrastructure*, COMM. ACM, May 2019, at 5, available at <https://m-cacm.acm.org/magazines/2019/5/236425-apis-standards-and-enabling-infrastructure/fulltext>.

²⁹⁹ *Id.*

³⁰⁰ *Google*, 141 S. Ct. at 1193.

Hypertext Transfer Protocol (HTTP) returns the error message, “404 Not Found,” when a call is submitted for a webpage that does not exist.³⁰¹

The SSO at issue in *Google v. Oracle* reflects an added level of complexity. The developers of Sun Java did more than just create subroutines, which they called *methods*, each with its own implementing code.³⁰² They also grouped similar methods into what they called *classes* and in turn grouped similar classes into libraries they called *packages*.³⁰³ They then relied on this hierarchy to establish the syntax that must be used to call the subroutine. To use the example discussed above, Sun Java’s syntax requires the call to specify the name of the relevant package (**java.lang**), class (**Math**), and method (**max**) along with the parameters required by the method being called, which in this case yields the following link:

java.lang.Math.max(4,6).³⁰⁴ The parties refer to this type of link as the *declaring code*, which served as the primary focus of the case.³⁰⁵

Although the Court did not address copyrightability, its fair use discussion provides interesting indications that help inform that inquiry. When focusing on the nature of the copyrighted work, the Court indicated that computer programs differ from purely aesthetic works such as “books, films and many other ‘literary works’” in that they “almost always serve

³⁰¹ Roy T. Fielding & Julian F. Reschke, *Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content 59* (Internet Eng’g Task Force (IETF) Request for Comments 7231 2014). To use a less high-tech example, the rules clear for first class mail that is undeliverable to be returned to the sender, while other classes of mail are discarded when the address cannot be found. These rules clarify how senders should interpret the fact that mail they have sent has not been returned. Senders of first class mail may generally assume that their posts were delivered properly, except in the unlikely event that they were lost or destroyed. Senders of other classes of mail understand that the absence of return mail is inherently ambiguous.

³⁰² *Google*, 141 S. Ct. at 1191.

³⁰³ *Id.*

³⁰⁴ *Id.* at 1193.

³⁰⁵ *Id.* at 1192.

functional purposes.”³⁰⁶ Computer code thus inevitably involves a mixture of expressive and functional features, which forces courts to confront difficult questions about which those aspects are protectible and which are not.³⁰⁷

The Court also found that APIs are different from other types of software. In contrast to the typical computer program, APIs’ declaring code play a distinctive role in inherently binding four types of elements: (1) Sun Java’s system for dividing up computing tasks in a particular way, which according to the Court “no one claims is a proper subject of copyright”; (2) the general idea of organizing tasks into a hierarchy, which the Court concluded was uncopyrightable; (3) the specific commands used to obtain the services of a subroutine, which Oracle did not suggest was copyrightable; and (4) the code implementing particular subroutines, which everyone agrees is copyrightable but Google did not copy.³⁰⁸ The only creativity involved is in choosing declaring names that programmers would find “intuitively easy to remember.”³⁰⁹

The Court further took notice of the testimony “drawing [a] critical line between user-centered declaratory code and the innovative implementing code.”³¹⁰ From this, the Court concluded that the declaring code embedded in user interfaces “differs to some degree from the mine run of computer programs” in that they “inherently b[i]nd together uncopyrightable ideas (general task division and organization) and new creative expression (Android’s implementing code).”³¹¹ Moreover, software systems like Java Sun and Android drive their “value in significant part . . . from the value that those who do not held copyrights, namely, computer

³⁰⁶ *Id.* at 1198.

³⁰⁷ *Id.* at 1198.

³⁰⁸ *Id.* at 1201.

³⁰⁹ *Id.* at 1202.

³¹⁰ *Id.*

³¹¹ *Id.*

programmers, invest of their own time and effort to learn the API’s system” and from “encourag[ing] programmers to learn and to use that system.”³¹² This inherently close tie between declaring code and functionality places it “further . . . from the core of copyright” that other types of computer programs and “points in the direction of fair use.”³¹³

The Supreme Court’s assertion that no one asserts that the particular manner in which Sun Java organizes tasks is copyrightable is subject to question.³¹⁴ Under *Feist* and its progeny, the copyrightability of compilations of uncopyrightable elements turns on whether the selection and arrangement of those elements was sufficiently original to merit copyright protection.³¹⁵ The Federal Circuit’s decision on copyrightability thus acknowledged Oracle’s concession that the idea of employing the package-class-method structure is not copyrightable but held that Oracle could copyright “its particular way of naming and organizing” the packets, classes, and methods in its software package.³¹⁶

The *Google* Court acknowledged that the names around which the declaring code is built represent a certain kind of creativity,³¹⁷ but failed to acknowledge the possibility of a copyright in the selection and arrangement of otherwise uncopyrightable elements acknowledged in *Feist*. This omission is in deep tension with the manner in which the Court described the software, in which it noted that “[a]n API divides and organizes the world of computing tasks in a particular way.”³¹⁸ This involves the selection of “precisely which set of potentially millions of different

³¹²

Id.

³¹³

Id. at 1202.

³¹⁴

Id. at 1201.

³¹⁵

See supra notes 209–215 and accompanying text.

³¹⁶

Oracle, 750 F.3d at 1367.

³¹⁷

141 S. Ct. at 1202.

³¹⁸

Id. at 1191.

tasks we want to have our Java-based computer systems perform and how we want those tasks arranged and grouped.”³¹⁹

C. Modularity Theory as the Bridge Between Languages and Software

Most importantly for the purposes of this article, the Court came tantalizingly close to invoking the Sapir-Whorf hypothesis when it drew a “rough analogy” between natural languages and “the declaring code’s organizational features.”³²⁰ The declaring code “divides into sets of concepts a world that in certain respects other languages might have divided differently” in much the same manner as natural languages.³²¹ This reasoning draws a direct parallel between the manner in which both software and language channel a complex reality into a particular conceptual structure. The computer science literature on modular systems has shown how the interfaces necessarily make certain information visible and other information hidden³²² and how those decisions predetermine the ways different tasks can interact with one another, which ultimately determines the functionality of the overall system.³²³

The computer science literature thus highlights how a software system’s interface selectively increase the salience of certain information and downplays the importance of others in much the same manner as natural languages under linguistic relativity. To the extent that the structure of natural languages embodies a certain world view, so does a software packages SSO. In addition, the deep connection between interface design and the system’s functionality adds

³¹⁹ *Id.* at 1192.

³²⁰ *Id.*

³²¹ *Id.* at 1192.

³²² Christopher S. Yoo, *Modularity Theory and Internet Regulation*, 2016 U. ILL. L. REV. 1, 10.

³²³ *Id.* at 11.

another level of depth to the link between the design of a software interface and its functionality (and the concomitant implications for copyrightability) identified by the Court.

The analogy between modular software and natural language systems potentially provides new insight and analytical support for linguistic relativity. The fact that the process of screening and channeling information plays an equally important role in systems that are intentionally devised suggests that it is not simply the result of biology, linguistics, or the limits of human cognition.³²⁴ The incorporation of parallel solutions in such widely disparate contexts suggests that it is best understood as a reflection of the process for managing complex systems through near decomposition identified by Nobel laureate Herbert Simon.³²⁵

Modularity theory also explains how the structural choices embodied in a particular architecture become institutionalized into an industry's organizational and intellectual culture.³²⁶ The tendency is captured in what has become known as *Conway's Law*, which asserts, in the words of two commentators, that "[t]he structure of any system designed by an organization is isomorphic to the structure of the organization."³²⁷ Melvin Conway's original formation envisions that organizational structure of the design team determines the design and envisioned that the principal mechanism was communication flows.³²⁸ Architectures become enshrined as technological paradigms that filter people's perceptions of which directions seem the most

³²⁴ There may be some aspects that are more closely tied to biology. For example, Whorf suggested that certain language structures make certain facts more memorable. *See supra* note 42 and accompanying text. Computers do not face the same difficulties remembering facts as humans.

³²⁵ Herbert A. Simon, *The Architecture of Complexity*, 106 PROC. AM. PHIL. SOC'Y 467 (1962).

³²⁶ 651 657-59.

³²⁷ EDWARD YOURDON & LARRY L. CONSTANTINE, *STRUCTURED DESIGN: FUNDAMENTALS OF A DISCIPLINE OF COMPUTER PROGRAM AND SYSTEMS DESIGN* 400 (2d ed. 1979).

³²⁸ Melvin E. Conway, *How Do Committees Invent?*, DATAMATION, Apr. 1968, at 28.

promising.³²⁹ Subsequent scholars have suggested that architectural commitments influence communication channels by filtering the information that passes through an organization.³³⁰

Technologies that are embedded in a larger system become part of a design hierarchy that entrenches a particular technological agenda.³³¹ As Conway noted, designs that have become entrenched end up driving the organizational structure instead of the other way around.³³²

The presence of this device in both natural languages and software packages suggests that linguistic relativity has roots in the problems posed by all complex systems. If so, the existence of modular structures in other domains suggests that the mechanism underlying Sapir-Whorf hypothesis is based on robust principles that are foundational. The fundamental nature of such modularity is confirmed by the fact that it is a feature of many other biological systems that have nothing to do with cognition, including pathogen structure, gene networks, protein interaction networks, and cell networks.³³³

Most interestingly for purposes of this Article, scholars have also used modularity to explore human cognition. Most notably, Jerry Fodor advanced his Modularity Thesis, which holds that the brain includes certain innate “vertical” faculties that perform predetermined, domain specific functions that produce a narrow range of outputs based on limited set of mandatory inputs in much the same manner as subroutines (the modules) that support broader “horizontal” faculties that operate as the central system that integrates the unordered mass of

³²⁹ Giovanni Dosi, *Technological Paradigms and Technological Trajectories*, 11 RES. POL’Y 147, 152-54 (1982). Dosi’s invocation of paradigms followed KUHN, *supra* note 39, at 109.

³³⁰ Clark 15 note 35; Tushman 82 note 75

³³¹ Kim B. Clark, *The Interaction of Design Hierarchies and Market Concepts in Technological Evolution*, 14 RES. POL’Y 235, 247 (1985).

³³² Conway, *supra* note 328, at _; *accord* FREDERICK P. BROOKS, JR., THE MYTHICAL MAN-MONTH: ESSAYS ON SOFTWARE ENGINEERING 111 (1975) (coining the term Conway’s Law and observing both effects).

³³³ For a survey of the literature, see, e.g., Dirk M. Lorenz et al., *The Emergence of Modularity in Biological Systems*, 8 PHYS. LIFE REV. 129 (2011).

information collected from a variety of sources.³³⁴ In addition, modules such as language act largely autonomous from central control in a manner similar to a reflex.³³⁵ His modularity thesis drew insights computer science, although some key differences remain.³³⁶ Indeed, he discusses it in terms of limiting inputs and encapsulating information in a manner almost identical to computer scientists.³³⁷

Fodor did not find “any need to deny the Whorfian point that the kinds of concepts one has may be profoundly determined by the character of the natural language that one speaks.”³³⁸ Indeed, Fodor recognized that a person’s experiences will determine which faculties actually get employed.³³⁹ Fodor’s key difference with Whorf is that he does not regard the human mind as a blank slate whose content is determined by the stimuli to which it is exposed.³⁴⁰ Instead, it already possesses key innate faculties even in its original state.³⁴¹ Although Fodor’s views were built on the innate faculties underlying Chomsky’s universal grammar, Chomsky disagreed with Fodor’s distinction between the central system and modules that operate largely independent of that central system as well as Fodor’s belief that the central system could not be fully understood.³⁴²

Fodor’s vision of language as a reflex encapsulated in a module is related to his claim that people think in the “Language of Thought,” which similarly posits that thinking occurs in abstract terms that are connected to specific languages only through a process of hypothesis

³³⁴ JERRY A. FODOR, *THE MODULARITY OF MIND: AN ESSAY ON FACULTY PSYCHOLOGY* 1, 12–14, 42–52, 86–97 (1983).

³³⁵ *Id.* at 64, 71–72, 83.

³³⁶ *Id.* at 37–39, 41.

³³⁷ *Id.* at 52–86.

³³⁸ JERRY A. FODOR, *THE LANGUAGE OF THOUGHT* 85 (1975).

³³⁹ *Id.*

³⁴⁰ *Id.* at 86 n.22.

³⁴¹ *Id.* at 82.

³⁴² NEIL SMITH, *CHOMSKY: IDEAS AND IDEALS* 18–21 (1999).

formation and testing.³⁴³ In so arguing, Fodor adopts the position reflected in Pinker’s claim, noted earlier, that humans think in “mentalese” independent of any particular language.³⁴⁴

The Language of Thought Hypothesis (often called “LOTH”) has generated a large academic literature exploring its tenets both philosophically and empirically in much the same manner as the Sapir-Whorf hypothesis.³⁴⁵ If correct, it suggests that ideas and expression may not be as independent as current copyright doctrine presumes. For example, Anthony D’Amato has noted that all of Chomsky’s examples to illustrate his universal grammar “depend[] upon the meanings of the words in the sentence.”³⁴⁶ This in turn suggested “that it is a very short step from claiming that there is an inherent grammar importuned in our brains to saying there are inherent meanings to words.”³⁴⁷

Linguistic relativity’s central proposition humans think in terms of specific languages as opposed to pure ideas independent of language actually cuts against the unity of ideas and expression, although it does suggest a connection between ideas and the structure of the language in which that expression is embodied. This connection inherent in mentalese is not a product of the inclusions and exclusions reflected in a language’s structure make certain types of concepts more salient, understandable, and memorable. Moreover, the entire idea that language can influence thought necessarily presupposes a degree of independence between the two.³⁴⁸

³⁴³ JERRY A. FODOR, *THE LANGUAGE OF THOUGHT* 66–79 (1975).

³⁴⁴ See *supra* notes 70–71 and accompanying text.

³⁴⁵ See Matthew Katz, *The Language of Thought Hypothesis*, INTERNET ENCYCLOPEDIA OF PHILOSOPHY (James Fieser & Bradley Dowden eds.), <https://iep.utm.edu/lot-hypo/> (accessed August 16, 2021); Michael Rescoria, *The Language of Thought Hypothesis*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Edward N. Zalta ed., summer 2019 ed.), <https://plato.stanford.edu/entries/language-thought/>.

³⁴⁶ Anthony D’Amato, *Pragmatic Indeterminacy* 85 NW. U. L. REV. 148, 153 n.16 (1990).

³⁴⁷ *Id.*

³⁴⁸ Zlatev & Blomberg, *supra* 96, at 3.

The debates over these propositions have yet to be resolved and probably never will be. Whatever their resolution, key copyright concepts such as the idea-expression dichotomy and the merger doctrine hang in the balance.

CONCLUSION

To date, copyright scholarship has almost completely overlooked the linguistics and cognitive psychology literature analyzing the connection between language and thought. An exploration of the two major strains of this literature, universal grammar and linguistic relativity, offer insights into the copyrightability of both constructed languages and the type of software packages at issue in *Google v. Oracle* recently decided by the Supreme Court.

Linguistic relativity theory promises to provide intellectual traction on the heretofore intractable challenge of distinguishing between protectible expression and unprotectible ideas. Analysis of the principles of linguistic relativity also suggests that the filtering function performed both by natural languages and APIs is best understood as an application of modularity theory as means for managing complex systems. The robustness of this solution across a wide range of domains attests to its fundamental nature. Moreover, Fodor's application of modularity theory and the Language of Thought Hypothesis to human cognition, if correct, pose a fundamental challenge to the idea-expression dichotomy.

The application of the insights of linguistic relativity eloquently demonstrate the benefits of incorporating linguistics and cognitive psychology into the analysis of copyright. Even though many areas in both fields remain hotly contested, an appreciation of the terms, scope, and trends in the debate would enhance our comprehension of copyright.