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RESEARCH ARTICLE

Einsteinian language: Max Talmey, Benjamin Lee Whorf and linguistic relativity

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Abstract

This paper explores the significant – albeit little-known – impact that physicist Albert Einstein's theory of relativity had on the development of the science of linguistics. Both Max Talmey, a physician who played a key role in the development of early twentieth-century constructed-language movements, and Benjamin Lee Whorf, who is closely associated with the notion of 'linguistic relativity', drew on their understanding of relativity to develop their ideas (and, in Talmey's case, also on his personal relationship with Einstein). Linguistic relativity, which posits that humans' linguistic categories shape their perceptions of nature, has often been tied to 'relativism' in the social sciences and humanities. In contrast, Talmey's commitment to reformulating the language of Einsteinian relativity – especially through a constructed language he built in the 1920s and 1930s – emphasized the significance of 'invariance' simultaneously in the scientific doctrine and in the language in which it was discussed. The semiotic flexibility of Einstein's 'relativity theory' as it was widely (and wildly) appropriated outside the small community of theoretical physicists enabled the two opposing moves, while obscuring the historical linkage between physics and linguistics for both.

> Just as it is possible to have any number of geometries other than the Euclidean which give an equally perfect account of space configurations, so it is possible to have descriptions of the universe, all equally valid, that do not contain our familiar contrasts of time and space. The relativity viewpoint of modern physics is one such view, conceived in mathematical terms, and the Hopi Weltanschauung is another and quite different one, nonmathematical and linguistic.
>
> Benjamin Lee Whorf[1]

> From those mystical notions the inference is drawn that right may be left and left may be right, past may come after the future, and effect may precede the cause. Such preposterous conclusions are arrived at through 'verbal hocus-pocus', as a critic of the relativity theory expressively characterizes the unintelligible talk of these relativists.
>
> Max Talmey[2]

1 Benjamin Lee Whorf, *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf* (2nd edn., ed. John B. Carroll, Stephen C. Levinson and Penny Lee), Cambridge, MA: MIT Press, 2012, p. 74. This quotation is originally from the posthumously published 'The American Indian model of the universe' by the *International Journal of American Linguistics* in 1950; it was likely composed around 1936.

2 Max Talmey, *The Relativity Theory Simplified: And the Formative Period of Its Inventor*, New York: Falcon Press, 1932, pp. 147–8.

In one of the twentieth century's most unfortunate branding snafus, Albert Einstein's account of the electrodynamics of moving bodies, and then its subsequent generalization to a theory of gravitation, came to be commonly known as 'relativity theory'. At a certain level, the moniker made sense. Einstein began his 1905 paper on special relativity by analysing the asymmetries in explanations between a coil moving toward a stationary magnet and vice versa, concluding that their relative motion was all that mattered, not motion with respect to some absolute frame of reference (such as the luminiferous ether) for the existence of which we had no empirical evidence. The interpretation was derived from Galileo Galilei's seventeenth-century analysis of uniform, unaccelerated motion: a ball dropped from the mast of a uniformly moving ship would describe a straight line to a passenger on the boat but a parabolic arc to an observer onshore – the physics was perfectly consistent relative to the frame of reference. Einstein made the same point with electromagnetic forces, so its designation as *Relativtheorie* by Max Planck in 1906 seemed appropriate.[3] Einstein first used the name in print the following year, citing Planck, yet complained about it in 1909, preferring the name *Invariantentheorie* ('invariance theory'), which failed to catch on.[4]

The trouble is that European thought has never lacked avowals, and denunciations, of varieties of relativism: moral, aesthetic, cultural and so on.[5] So the problem with calling a theory describing the relativity of distant simultaneity – that is, that observers witnessing flashes of light might have differing accounts of their times of occurrence depending upon their relative (very, very fast) motion – something like 'relativity' was the inevitability of conflation with unrelated ideas. If relativity theory in physics meant that there were no absolute standards or absolute truths, then had the inmates finally conquered the last, most impregnable asylum? The allegation was prominent among the (heavily anti-Semitic) Anti-Einstein League in the early 1920s, and discomfort with the label has never entirely vanished.[6] Much scientific, philosophical and historical ink has been spilled trying to rectify the damage, primarily by pointing out that Einstein's theory – especially in the four-dimensional interpretation given by his erstwhile mathematics teacher Hermann Minkowski – really showed how these relativities of perception can be replaced by a more fundamental invariance of 'world lines' that took time into account alongside the spatial coordinates, yielding what Minkowski called 'the absolute world'.[7] It is hard to escape the impression that this disagreement is fundamentally about language.

Language was precisely the realm where one of the most persistently controversial of relativisms has taken root. In December 1940, an amateur linguist (and full-time employee at the Hartford Fire Insurance Company) named Benjamin Lee Whorf (1897–1941) published an article entitled 'Linguistics as an exact science' in *Technology Review*, the magazine of his alma mater, the Massachusetts Institute of Technology. This article, the second in a series, further developed

> the 'linguistic relativity principle', which means, in informal terms, that users of markedly different grammars are pointed by their grammars toward different

3 Max Planck, 'Die Kaufmannschen Messungen der Ablenkbarkeit der β-Strahlen in ihrer Bedeutung für Dynamik der Elektronen', *Physikalische Zeitschrift* (1906) 7, pp. 753–61, 756.

4 Arthur I. Miller, *Albert Einstein's Special Theory of Relativity: Emergence (1905) and Early Interpretation, 1905–1911*, Reading, MA: Addison-Wesley Pub. Co., 1981, p. 173.

5 Maria Baghramian and J. Adam Carter, 'Relativism', *The Stanford Encyclopedia of Philosophy* (Spring 2021 edn, ed. Edward N. Zalta), at https://plato.stanford.edu/entries/relativism.

6 Milena Wazeck, *Einstein's Opponents: The Public Controversy about the Theory of Relativity in the 1920s* (tr. Geoffrey S. Koby), Cambridge: Cambridge University Press, 2014.

7 See, for example, Peter Galison, 'Minkowski's space–time: from visual thinking to the absolute world', *Historical Studies in the Physical Sciences* (1979) 10, pp. 85–119.

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> 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.[8]

Often known as the Sapir–Whorf hypothesis – incorporating the name of his mentor, Yale linguist Edward Sapir – the contention comes in strong and weak variants: respectively that our linguistic categories either determine what we can know, or that those linguistic categories only influence our thought. These arguments built implicitly upon a longer tradition, often identified with Gottfried Herder and Wilhelm von Humboldt, that styles of thought are linked to particular languages.[9] Whorf's ideas have always been intensely controversial, and the debates comprise a vast literature within linguistics, though they have attracted comparatively little attention in the history of science, which with few exceptions has not embraced twentieth-century linguistics as a major topic of study.[10]

This article is about the relativity half of 'linguistic relativity', and although it begins and concludes with Whorf, it will focus largely on the tangled career of Max Talmey (1869–1941), and through him Albert Einstein. Einstein is, of course, a household name, and so perhaps is Whorf (if you happen upon humanistic or linguistic academic households); rare is the house where Talmey's memory has ever been invoked. This is not especially surprising, and I do not claim this native of Tauroggen in the Russian Empire (now Tauragė in Lithuania), who spent most of his life as an ophthalmologist in New York City, as an unsung hero of the history of science. Nonetheless, his commitment to reformulating the language of Einsteinian relativity – especially through a constructed language he built in the 1920s and 1930s – brings to the surface the tensions between 'relativity' and 'invariance' simultaneously in the scientific doctrine and in the language in which one discusses it.[11] I begin with Talmey and his constructed languages before transitioning to his engagement with relativity and Einstein, and then follow Whorf's own interest in Einstein's science as a key to understanding language, and vice versa.

I argue that the divergence between Whorf and Talmey – with the former drawing heavily on the 'relativistic' to push for what we can call (almost precisely in the Kuhnian sense) a *revolutionary* chasm separating human languages, while the latter

8 Whorf, op. cit. (1), pp. 282–3.

9 Wilhelm von Humboldt, *On Language: On the Diversity of Human Language Construction and Its Influence on the Mental Development of the Human Species* (ed. Michael Losonsky, tr. Peter Heath), Cambridge: Cambridge University Press, 1999. On this tradition see Lia Formigari, *A History of Language Philosophies* (tr. Gabriel Poole), Amsterdam: John Benjamins, 2004, Chapter 6.

10 In general on 'the Sapir–Whorf hypothesis' see Lila Gleitman and Anna Papafragou, 'New perspectives on language and thought', in Keith J. Holyoak and Robert G. Morrison (eds.), *The Oxford Handbook of Thinking and Reasoning*, New York: Oxford University Press, 2012, pp. 543–68; Penny Lee, *The Whorf Theory Complex: A Critical Reconstruction*, Amsterdam: J. Benjamins, 1996; and Guy Deutscher, *Through the Language Glass: How Words Colour Your World*, London: William Heinemann, 2010. For a historical overview of the debate over linguistic complexity see John E. Joseph and Frederick J. Newmeyer, '"All languages are equally complex": the rise and fall of a consensus', *Historiographia Linguistica* (2012) 39(2–3), pp. 341–68. For histories of science that treat modern linguistics see Gregory Radick, 'The unmasking of a modern synthesis: Noam Chomsky, Charles Hockett, and the politics of behaviorism, 1955–1965', *Isis* (2016) 107, pp. 49–73; Judith R.H. Kaplan, '"Unraveling Babel": Mary LeCron Foster on the origins of language', *BJHS Themes* (2021) 6, pp. 97–113; Jamie Cohen-Cole, 'The politics of psycholinguistics', *Journal of the History of the Behavioral Sciences* (2015) 51(1), pp. 54–77; Janet Martin-Nielsen, '"It was all connected": computers and linguistics in early Cold War America', in Mark Solovey and Hamilton Cravens (eds.), *Cold War Social Science*, New York: Palgrave Macmillan, 2012, pp. 63–78; and Michael D. Gordin, 'The Dostoevsky machine in Georgetown: scientific translation in the Cold War', *Annals of Science* (2016) 73(2), pp. 208–23.

11 Throughout, I will use the term 'constructed language' to denote what are popularly known as 'artificial languages'. As linguist Otto Jespersen noted in 'Nature and art in language', *American Speech* (1929) 5, pp. 89–103, there is much that is artificial in so called 'natural languages', and plenty of natural processes at work in, say, Esperanto.

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emphasized the 'invariant' nature of linguistic meaning to propel a *reformist* conception of a model language to promote universal understanding – masks a deeper similarity in their approaches: a conflation of grammar (the rules by which individuals assemble words) and lexicon (the collection of words available to be so assembled). Whorf collapsed the latter into the former, Talmey the reverse. The semiotic flexibility of Einstein's 'relativity theory' as it was widely (and wildly) appropriated outside the small community of theoretical physicists enabled the two opposing moves, while obscuring the historical linkage between physics and linguistics for both.

Max Talmey's tongues

Max Talmey was a man who believed that rationality could and should shape the words we use, and he bore that conviction in his own name. Born Max Talmud in a largely Polish region of imperial Russia, he joined his older brother Bernard in transmogrifying their overtly Jewish surname, with its overtones of the Pale of Settlement, upon emigrating to the United States in 1895.[12] Max succeeded Bernard in many things, including a career in medicine (both studied in Munich), a specialization in ophthalmology, and even a joint practice until Bernard's death in 1926. Quite distinctive about Max, on the other hand, was a fixation on the problems posed by language. 'One of my earliest hobbies was languages', he wrote in 1930. 'It came about through the poverty of words in my mother tongue, which was a mere dialect. The first real language I learned in school.'[13] It would not be his last.

Talmey developed characteristic practices in pushing his ideas into the public sphere and seeking endorsements from the famous; the main focus in this article is on how this worked in his linguistic efforts, but it is important to recognize that the pattern began in medicine. Affiliated with a number of leading institutions in the city (Harlem Eye, Ear, and Throat Infirmary, Metropolitan Hospital and Dispensary, Mt Sinai Hospital, and Yorkville Hospital), Talmey's practice was situated at 55 West 126th Street in Manhattan, where he developed a particular reputation in cataract surgery.[14] Alongside his professional achievements, he raised a family, first marrying Minnie Bythiner, who died in 1914, and then Hellen Buff, who survived him, along with two daughters, Frieda Ernestine and Elsa Louise. He supplemented his comfortable career with repeated efforts at medical punditry, his disparate interventions characterized by a tremendous confidence in the correctness of his own judgement.

He enjoyed being in the newspapers, and had repeated success inserting his name into the *New York Times* in particular over the course of his life, a reminder of the periodical's local flavour before the Second World War. He began in 1902, drawing on his professional credentials to assuage parents' fears about a reported trachoma epidemic in the schools.

12 Albrecht Fölsing, *Albert Einstein: A Biography* (tr. and abridged Ewald Osers), New York: Penguin Books, 1997 (first published 1993), p. 744 n. 32.

13 Max Talmey, 'Model language and the essentials of Arulo', *Modern Language Journal* (1930) 14, pp. 386–95, 386. This is presumably a reference to Yiddish. *Pace* Talmey, there is no question that Yiddish is a fully fledged language, even accounting for the squishiness of the distinction between 'dialect' and 'language'.

14 Details of the practice, and a full bibliography of Max Talmey's medical writings (nearly all published in the *New York Medical Journal*), are available in the only secondary source on him: James G. Ravin, 'Albert Einstein and his mentor Max Talmey', *Documenta Ophthalmologica* (1997) 94, pp. 1–17. See also the series of obituaries: 'Dr. Max Talmey dies; eye and ear specialist', *New York Herald Tribune*, 8 November 1941, p. 10; 'Dr. Max Talmey', *Chicago Daily Tribune*, 8 November 1941, p. 22; 'Max Talmey dies; eye specialist, 72', *New York Times*, 7 November 1941, p. 24. His excellent record with cataracts was touted in the press: 'Sight is restored after twenty years', *New York Tribune*, 2 January 1916, p. 12.

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(It was there, but no worse than in previous years, and entirely treatable.)[15] By the end of the decade, he had branched out, publishing an introductory textbook on psychology and psychiatry, *Psyche*, aimed at orienting medical and legal students.[16] (In later years, he would build on this foundation to rail against Freudian psychoanalysis, though the press was less willing to indulge his polemics.[17]) In his final decade, Talmey became convinced that the enthusiasm for tonsillectomies was behind the outbreaks of infantile paralysis (polio) that swept the country, and attempted repeatedly to persuade newspapers to print his theory, with very limited success.[18]

Psyche gave Talmey a local reputation as a physician who knew his way around the law, and this set the stage for his most public moment of notoriety. On 28 July 1911, a bellhop at the Iroquois Hotel in New York City named Paul Geidel – then seventeen years old – was arrested for having broken into the room of seventy-three-year-old William H. Jackson two days earlier, suffocating him to death with a chloroform-infused rag, and ransacking the room (yielding only a few dollars). The sensational Geidel trial, in part because the minor was tried as an adult, galvanized the press. Although by profession an ophthalmologist and never having examined Jackson's body before or after death, Talmey (among others) claimed on the stand for the defence that Jackson died of myocarditis and not suffocation, and was prominently featured in papers nationwide.[19] Geidel was convicted of second-degree murder, and served a total of sixty-eight years and 296 days in New York state prisons, being released on parole on 7 May 1980 at age eighty-six. He holds the record as the longest-serving inmate in the American penal system.

After the Geidel affair, Talmey withdrew from court testimony and concentrated even more on his major avocation: the quest for an ideal language.[20] His interest began back in Europe, where as a boy he began to learn the first popular constructed language, Volapük, but it 'only brought disappointment and was given up after half a year'.[21] Instead, he

15 Max Talmey, 'Trachoma in the schools', *New York Times*, 9 November 1902, p. 30. Trachoma was at this moment identified with Jewish immigrants, which may explain Talmey's attention to it. See Howard Markel, '"The eyes have it": trachoma, the perception of disease, the United States Public Health Service, and the American Jewish immigration experience, 1897–1924', *Bulletin for the History of Medicine* (Fall 2000) 74(3), pp. 525–60.

16 Max Talmey, *Psyche: Concise and Easily Comprehensible Treatise on the Elements of Psychiatry and Psychology for Students of Medicine and Law*, New York: The Medico-Legal Publishing Company, 1910.

17 Talmey to Albert Ingalls, 30 October 1939, Max Talmey Papers, V27, Sammlung für Plansprachen, Austrian National Library, Vienna, Austria (hereafter Talmey Papers), Box 9, folder 'Scientific American (McHugh, F.D.)'. The famously irascible cultural critic H.L. Mencken praised one of Talmey's articles excoriating the Freudians: Mencken to Talmey, 27 December 1939, Talmey Papers, Box 7, folder 'H.L. Mencken'. Talmey made numerous copies of this letter for distribution.

18 Max Talmey, 'Who wants to drown his dog accuses him of rabies' manuscript, 5 December 1940, Talmey Papers, Box 6, folder 'Medical record Gregory Stragnell'. One of his last communications on this subject solicited the assistance of *New York Post* columnist Samuel Grafton, out of admiration for his fair-mindedness: Talmey to Grafton, 24 November 1940, Talmey Papers, Box 3, folder 'Grafton Samuel'.

19 'Claim bellboy's victim died of heart disease', *San Francisco Chronicle*, 30 August 1911, p. 1; 'Physicians aid Geidel', *Baltimore Sun*, 30 August 1911, p. 15; 'Experts trying to save youth', *Los Angeles Times*, 30 August 1911, p. 13; 'On stand to save her son', *Washington Post*, 30 August 1911, p. 1; and 'Geidel verdict today', *Baltimore Sun*, 31 August 1911, p. 2.

20 In early modern Europe, the original such efforts focused on creating a perfect language, often by generating entirely new words and seeking to build a one-to-one map with nature (associated most clearly with John Wilkins, though he was one of several). The projects discussed in this article stem from a late nineteenth-century tradition which tried instead for the more modest goal of a simple means of international communication built out of existing tongues. On the precursors see especially Umberto Eco, *The Search for the Perfect Language* (tr. James Fentress), Oxford: Blackwell, 1995; and Rhodri Lewis, *Language, Mind and Nature: Artificial Languages in England from Bacon to Locke*, Cambridge: Cambridge University Press, 2007.

21 Talmey, op. cit. (13), p. 388.

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turned to its fastest-growing competitor, L.L. Zamenhof's Esperanto, published in 1889.[22] In 1905, Talmey founded the New York Esperanto Society, which he erroneously claimed introduced Zamenhof's language to the United States. More important still was his 1906 *Practical and Theoretical Esperanto*, the first such textbook written in English.[23] Although the book is thorough and pedagogically effective, one can already see between the lines – especially in the footnotes quibbling about pronunciation – that Talmey was losing patience with Esperanto, much as he had with Volapük.

In 1907, he found something better. That October, the Delegation for the Adoption of an International Auxiliary Language, meeting in Paris, decided to endorse not the more popular Esperanto but rather the last-minute proposal of the anonymous 'Ido' (meaning 'descendant' in Esperanto) that reformed many of the features of Zamenhof's language that Talmey also happened to dislike (the compulsory accusative, the *a priori* relational pronouns, and the circumflexed alphabet). This verdict triggered an astounding schism within the Esperanto movement, with a sizable number of the movement's intellectual leaders – including mathematician Louis Couturat, the chair of the Delegation and one of the few constructed-language enthusiasts that Talmey respected – defecting to 'Ido"s project. ('Ido' was soon unmasked as the Marquis de Beaufront, the leading French proponent of Esperanto.)[24]

Talmey resigned from the New York Esperanto Society that he had founded 'because he became disgusted with Esperanto', and arranged a coup within its shrinking ranks, which had declined from several hundred to fifteen. On 19 November 1908, the members of the society, with Talmey's encouragement, 'voted unanimously that Esperanto was too full of logical defects to be worth wasting any more time on'.[25] Talmey took to the press to defend what he called 'the Language of the Delegation (LD)' or 'Ilo' or just 'IL' (for 'international language'), but occasionally had to resort to the 'absurd name' Ido. He published linguistic critiques of Esperanto, a satire and many other articles in Couturat's journal *Progreso*, and in January 1914 completed an authoritative Ido textbook, the publication of which was delayed until after the Great War (which claimed Couturat as a victim in an automobile accident).[26]

Talmey continued writing in and on Ido, including several essays a year in both *Progreso* and *Mondo*, its principal outlets.[27] Yet he lamented that after Couturat's demise 'enthusiasts and dilettantes got control of it causing it to deteriorate more and more. I

22 Dr Esperanto [L.L. Zamenhof], *Mezhdunarodnyi iazyk: Predislovie i polnyi uchebnik* (Warsaw: Kh. Kel'ter, 1887), 28. Zamenhof was also an ophthalmologist from the Polish-speaking regions of the Russian Empire. There is no evidence that he and Talmey ever met, although they certainly corresponded. On the history of Esperanto, as well as the subsequent Ido schism, see Esther Schor, *Bridge of Words: Esperanto and the Dream of a Universal Language*, New York: Metropolitan, 2016; and Michael D. Gordin, *Scientific Babel: How Science Was Done before and after Global English*, Chicago: The University of Chicago Press, 2015, Chapters 4, 5.

23 Max Talmey, *Practical and Theoretical Esperanto: A Handy Textbook for Beginners and Advanced Students, for Selfinstruction and Teaching Purposes*, New York: Universal Language Publishing, 1906. On the New York Esperanto Society's founding see Max Talmey, 'The auxiliary language question', *Modern Language Journal* (1938) 23, pp. 172–86, 177. For a more accurate timeline of Esperanto's introduction into the United States than Talmey's see Ulrich Becker (ed.), *Esperanto in the New York Times (1887–1922)*, New York: Mondial, 2010.

24 He was also not really a marquis. Talmey gives his own partisan version of this history in 'The problem of an auxiliary international language and its solution', *Scientific Monthly* (October 1923) 17(4), pp. 342–60, 346–9.

25 'Give up Esperanto, will now speak Elo,' *New York Times*, 27 November 1908, p. 8. See also '"Ilo", new world language', *Baltimore Sun*, 23 November 1908, p. 2.

26 Max Talmey, *Defects of Esperanto, Its Decline and the Growth of ILO*, New York: Universal Language Publ. Co., 1909; Talmey, 'Pensosplitoj pri la lingvo internacia', *Progreso* (May 1908) 1, pp. 83–6; Talmey, *Ido: Exhaustive Text Book of the International Language of the Delegation and Fundamentals of an Artificial International Language*, New York: Ido Press, 1919; and Talmey, 'Logical shape of the auxiliary international language', *American Medicine* (August 1923) 18(8), pp. 563–74.

27 Many of these were reworked in three books of the early 1920s: Max Talmey, *Lektolibro di Ido: Konsili ed exempli pri bona stilo e pri la tradukado*, New York: Ido Press, 1922; Talmey, *Non raporti al Idoakademio*, New York: Ido Press, 1922; and Talmey, *Filologiala temi egardenda en logikala linguo*, New York: Ido Press, 1923.

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began, therefore, to reform the LD all by myself'. Until 1925, that is, when he decided that his emendations, using the 'sixteen natural languages with which I am more or less familiar', had so transformed Ido that he was looking at something new:

> I gave up the LD entirely because it, too, fell short of my ideal, the Model Language, and was degenerating more and more. I constructed a system of my own to serve as the basis for the Model Language. I called it Arulo, a name formed from the initial letters of the expression 'Auxiliary Rational Universal Language'.[28]

Arulo abounded in ironies, not least that Talmey was on record opposing languages that had been created by a single author, which tended to get wrapped up in egos.[29] He published his first book on Arulo in 1925, followed by a more detailed study in the language in 1927.[30] He was fully aware that those volumes reached a minuscule readership, and that if he wanted people to use Arulo he would have to go about matters differently. He made a strong push with his friend Oscar Roos, in the pages of *Wireless Age*, to establish Arulo (under the moniker 'Ilo') as the future of ham radio, enabling hobbyists across the globe to communicate without language barriers – an uncharacteristic emphasis on the oral rather than the written for Talmey.[31] The Esperantists were predictably dismissive.[32]

After a few years with the nominalized acronym 'Arulo', he decided to rebrand with a name that emphasized that this was to be a utilitarian means of communication, but was also catchy.

> This sense is distinctly contained in the name Glo-r-o, which was made possible after our system had been enriched by a word for sense No. 2 exclusively, namely by the word gloto which signifies nothing else but 'means of communication not peculiar to a people'. The first syllable of this word and the initial of the word 'racionoza' = rational, furnish the euphnious [*sic*] name Gloro, which signifies 'rational means fo [*sic*] communication not peculiar to a people' ...[33]

And so 'Gloro' it became – though one of his few correspondents in Gloro, the physician L.B. Woodcock of Scranton, Pennsylvania, thought an extra syllable might do the trick, and made the case for 'Glotoro.'[34] Talmey stood firm.

28 Talmey to A. Paul Maerker-Branden, 25 September 1930, Talmey Papers, Box 6, folder 'Maerker-Branden, Paul A.'.

29 Talmey, op. cit. (24), p. 356.

30 Max Talmey, *Arulo: Text Book of the Universal Language with Exercises and Partial Dictionary*, New York: Ilo Press, 1925; Talmey, *Lexikologio di Arulo: Sugestioni*, New York: Ilo Press, 1927.

31 'Ilo Language Society appeals to radio fans', *Washington Post*, 26 October 1924, p. EF5; Max Talmey, 'AIL: The auxiliary international language problem', *Wireless Age* (April 1925) 12(7), pp. 9–11, 32; Talmey, 'The relationship of Ilo to the international language problem', *Wireless Age* (May 1925) 12(8), pp. 18–19, 27; Talmey, 'Fundamental principles and further illustrations of Ilo', *Wireless Age* (June 1925) 12(9), pp. 18–19, 36; Talmey, 'Lessons in improved Ilo', *Wireless Age* (July 1925) 12(10), pp. 39, 50; (August 1925) 12(11), pp. 19, 50, 52; Oscar C. Roos, 'AIL: U.S. Ilo organizations – their functions and activities', *Wireless Age* (July 1925) 12, pp. 38, 54; and Roos, 'Europe and the AIL: some sources of information,' *Wireless Age* (August 1925) 12(11), pp. 18–51. A lexicon specifically for radio had been published in Ido in 1924, before the advent of Arulo: K. Feder and J. Nordin, with Oscar C. Roos, *Internaciona Radio-Lexico en Ido e Germana, Angla, Franca, Italiana e Hispana, kun Defini, Formuli, Tabeli edc.*, Stockholm: P. Ahlberg, 1924. This debate is treated briefly in Richard A. Bartlett, *The World of Ham Radio, 1901–1950: A Social History*, Jefferson, NC: McFarland & Company, 2007, pp. 93–4.

32 James Denson Sayers, 'Esperanto as World Radio Language', *Wireless Age* (July 1925) 12(10), pp. 18–19.

33 Talmey to Emory B. Linsley, 20 April 1937, Talmey Papers, Box 6, folder 'Linsley, Emory B.'. Linsley was the postmaster of Willow River, Minnesota.

34 L.B. Woodcock to Talmey, 15 October 1936, Talmey Papers, Box 11, folder 'Woodcock, L.B.'.

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What was Gloro? Certainly not a stable entity, as it was constantly being improved, so any specific aspect might be tweaked, especially as regards lexicon. The grammar, however, was fixed in its general details, and in publications intended for a general audience he preferred to illustrate it by translating well-known texts and juxtaposing the original with a translation. Here, for example, is the opening line of Abraham Lincoln's Gettysburg Address ('Lincolnof Gettysburg Aloquo'): 'Quar duadeki e sept yari retre nia patri productid sur questa kontinento un nova naciono konceptita in libertato e dedikita a la propoziciono, ke omna homi es kreita egala.' Talmey would vociferously deny any descent from Esperanto or even from Ido, but his reliance primarily on Romance roots for word formation and the use of suffixes to indicate grammatical properties show his strong debt to Zamenhof. Talmey stressed the points of difference: while Esperanto used seven grammatical endings, and Ido expanded that number to fourteen, by 1940 Gloro had acquired eighteen – which Talmey claimed meant greater precision.[35] Talmey did not dwell on the grammar in writings for the general public, hoping that reading the translations would spur interest in learning the language:

> Gloro is readable by an educated person almost at sight because the roots of all its words are taken from the natural languages and one simple rule comprises its whole elementary grammar, to wit: Invariable endings characterize the main parts of speech, a noun terminating in -o; an adjective in -a; an adverb in -e; a plural in -i; the possessive case in -of; the objective case in -n; the infinitive in -ar; the present tense in -as; the past, future and conditional, respectively, in -is (-id), -os (-od), -us (ud); the optative in -am; the imperative in -ez; an adjective denoting a person in -u.[36]

(It bears stressing that this is very close to Esperanto, despite Talmey's protestations; anyone who knows that language can navigate Gloro with ease.)

I have found no evidence that anyone ever spoke Gloro, but it did have fans. Writing to a correspondent in 1930, Talmey stressed quality rather than quantity: 'There are only three Arulisti in existence, and you would make an excellent fourth one ... Arulo is not concerned about numbers, only about quality; there are altogether three Arulists in the whole world, and they are quite happy and proud of this.'[37] Talmey's surviving correspondence indicates several interactions with the Gloro-curious. He had an extensive two-way exchange in the language with Woodcock and also F. Vandervoor, a peripatetic individual who wrote from San Francisco, Hawaii and Tianjin. During the 1930s, he also traded letters with a young linguistics student in Texas named Meredith Gardner, who earned Talmey's praise for his ability to pen a grammatically flawless Gloro letter in his first epistle to Talmey.[38] (Gardner would become a cryptographer, lionized for his incredible feat of cracking the Soviets' one-time pads of the Venona espionage intercepts in 1946.[39]) Not everyone had Gardner's gifts. One correspondent gave it his best go:

> Me havas nula scientio ankore di Gloro, ma vu vidas ke me tryas. Vu seemas ne havar un dictionario directa in your Arulo Textbook nor elsewhere, ed consequente me

35 Max Talmey, 'Word derivation in a logical language', *Modern Language Journal* (1940) 24, pp. 617–28, 617.

36 Max Talmey, *An Obstacle to World Peace; and a Remedy for It Illustrated by Lincoln's Gettysburg Address and the Retreat from Moscow*, New York: The American Gloro Society, 1941, p. 4.

37 Talmey to Eugene F. McPike, 6 April 1930, Talmey Papers, Box 6, folder 'Eugene F. McPike'. By 1940, the numbers had dwindled: 'Only two people can speak Gloro. One of them is a physician in Scranton, Pennsylvania, and the other is its inventor, Dr. Max Talmey of New York'. Walter Modell, 'The road to Gloro', *American Mercury* (July 1939) 47(187), pp. 341–3, 341.

38 The exchange is contained in the folder under Gardner's name in Box 3 of the Talmey Papers.

39 John Early Haynes and Harvey Klehr, *Venona: Decoding Soviet Espionage in America*, New Haven, CT: Yale University Press, 1999, p. 33.

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verdas forcar usar verbi anglisa e latina e francesa, and perhaps la resulto esas something of a hash. Please forgive me.[40]

An occasional interlocutor would criticize the logic behind Gloro in detail, eliciting lengthy (and heated) defences from Talmey.[41]

Not discouraged, he kept trying to recruit new Glorists. He had done this once before with the New York Esperanto Society, and in 1937 he asked his lawyer how to incorporate an American Gloro Society, and began recruiting members.[42] He wrote to one young man who had inquired about materials to learn Gloro that he would be able to help him with a dictionary and textbook only if funds were available, and the best way to do so was to establish an American Gloro Society. 'You would be welcome as a charter member', he offered. 'Would you care to be one? Perhaps you can get 4–5 other people interested in the matter. The society could then be formed. Another young man is ready to join it.'[43] Talmey was aiming for six to eight initial members to get the venture off the ground. The American Gloro Society remained notional until Talmey's death.

Another strategy, reminiscent of his medical popularizations, was to seek endorsements from those who did not know the language but might be willing to look it over, whether they were knowledgeable or just famous. He sometimes met with success, more from the former category than from the latter. Brown University's librarian, H.L. Koopman, gave it his support, and the distinguished Yale philologist Eduard Prokosch noted to a third party that Gloro was 'for certain far better than Esperanto and, as far as I can judge, also better than [linguist Otto Jespersen's constructed language] "Novial."'[44] (Talmey took that as a win.) The famous were less responsive. George Bernard Shaw wrote back, but not to the point, instead choosing to mock Volapük 'and all its successors, mostly dead of excessive inflection and reckless ugliness'.[45] Thomas Mann never replied.[46] Talmey's biggest gambit was to associate his theory with the most famous person he knew of: Albert Einstein. Gloro would make a difference through its scientific potential, as the mechanism to explain Einstein's relativity theory to the world. This effort happened on two levels: that of the science and that of the scientist.

40 Edmund C. Berkeley to Talmey, 29 April 1937, Talmey Papers, Box 1, folder 'Berkeley, Edmund C.'. Berkeley later became widely known for one of the earliest books on computers: *Giant Brains; or, Machines That Think*, New York: Wiley, [1949].

41 Talmey to E.J. Horace, 20 August 1939, Talmey Papers, Box 4, folder 'Horace, E.J.'.

42 Talmey to Norman L. Marks, 8 April 1937, Talmey Papers, Box 6, folder '"Lind, Shlivek, Marks & Brin" Norman Marks'. See also Talmey to Emory B. Linsley, 20 April 1937, Talmey Papers, Box 6, folder 'Linsley, Emory B.'.

43 Talmey to Sidney Mazo, 1 June 1937, Talmey Papers, Box 6, folder 'Sidney Mazo'.

44 Eduard Prokosch to Frank Mankiewicz, 6 May 1929, Talmey Papers, Box 6, folder 'Frank Mankiewicz'. Talmey, who knew Jespersen from their days as Idists, also disapproved of Novial, which attempted to modify Ido in the direction of sounding more euphonious and naturalistic, rather than Talmey's direction of increasing rationalization. See Talmey, 'Critical remarks on Novial', *Modern Language Journal* (1929) 14, pp. 228–33. Jespersen's only brief mention of Talmey in print – in the very book that introduced Novial – was positive. Otto Jespersen, *An International Language*, London: George Allen & Unwin, 1928, p. 48. For Koopman see his statement of endorsement, 21 August 1938, Talmey Papers, Box 2, folder 'Brown University Library (Koopman, H.L.)'.

45 Quoted in Talmey to C.L. Hunt, 31 July 1939, Talmey Papers, Box 4, folder 'Hunt'. Shaw's views are more fully treated in Reto Rossetti, 'Bernard Shaw on the question of an international language in correspondence with Reto Rossetti (1949–1950)', in *Serta gratulatoria in honorem Juna Régulo*, vol. 2, La Laguna, Canary Islands: Universidad de la Laguna, 1987, pp. 663–74.

46 Talmey to Thomas Mann, 4 October 1938, Talmey Papers, Box 6, folder 'Thomas Mann'.

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Spacetime Gloro

In 1932, Talmey began a popular article on relativity theory arguing that the fundamental problem with comprehending Einstein's theory was linguistic: 'It is a fact that even highly educated laymen have very little understanding of the relativity theory. What largely contributes to this is that in expounding the theory phrases are used to which attaches a mystical meaning, or which convey no meaning at all, in ordinary language.'[47] This piece appeared in the middle of a two-decade-long campaign to achieve linguistic clarity about special and general relativity, at first in ordinary English, and eventually in superior Gloro.

The apex of this effort was his 1932 book *The Relativity Theory Simplified*, which is indeed an excellent, mostly non-mathematical, introduction to the topic.[48] The approach of this 'oculist of 266 West 113th Street', as the *New York Times* identified Talmey in an article announcing the publication, was to walk a middle path between being '"popular" in the ordinary sense', which would be 'worthless for those wishing to gain some insight into the theory. The latter is a subject that cannot be made "popular", intelligible to the masses'.[49] Rather, one must include some mathematics and avoid unnecessary mystifications.[50] From the moment he became aware of relativity theory amid the global fanfare surrounding the successful 1919 eclipse expedition to measure the curvature of starlight around the Sun, Talmey dedicated himself to explaining to the interested public both relativity and his understanding of language.

Talmey worked along two lines, that of the 'International Language (IL)' and of the 'Model Language (ML)', terms he articulated often in his linguistic publications but left implicit in his scientific writings. International languages, according to Talmey, were projects like Volapük and Esperanto which were 'put forth as an auxiliary language chiefly for the expression of common everyday thoughts and it is in this sense that it is commonly understood. Now there is no need at all for an auxil. language to express everyday thoughts, hence there is no need for an IL'.[51] In striving for maximum internationality, these projects simply replicated the logical flaws of existing languages without ever attaining the latter's euphony or ease of idiomatic expression.

The model language was different; indeed, recognizing the distinction between the two had been essential for his development of Gloro. The impetus to move from Ido (IL) to Arulo (ML) was the persistence of arbitrary forms in the former; the purging and rationalization of those errors would asymptotically approach a model language.[52] The extreme rationalization of expression possible here resonated strongly with his elitism regarding 'popular science': this was a mode of expression 'for people of substantial education,

47 Max Talmey, 'Einstein's theory and rational language', *Scientific Monthly* (1932) 35, pp. 254–7, 254.

48 Talmey, op. cit. (2). It earned praise from the leading science journalist of the day: Waldemar Kaempffert, 'Relativity simplified', *New York Times*, 19 March 1933, p. BR17.

49 Talmey to Jacob de Haas, 6 June 1931, Talmey Papers, Box 4, folder 'Haas, Jacob de'. 'Says Einstein at ten was eager student: Dr. Max Talmey, friend of scientist since childhood, to write book explaining his work', *New York Times*, 17 February 1931, p. 6

50 Max Talmey, 'The fundamentals of the relativity theory', *Scientific Monthly* (January 1932) 34(1), pp. 41–8, 41; Talmey, 'Essentials of the general relativity theory', *Scientific Monthly* (February 1933) 36(2), pp. 138–43. In a book review, Talmey was savage toward those who excoriated relativity (as 'relativist') without adequate engagement with the mathematics. Talmey, review of James Mackaye's *The Dynamic Universe*, *American Mathematical Monthly* (January 1932) 39(1), pp. 36–40.

51 Talmey to A. Paul Maerker-Branden, 25 September 1930, Talmey Papers, Box 6, folder 'Maerker-Branden, Paul A.'. See also Talmey to A.J. Angman, 1 February 1930, Talmey Papers, Box 1, folder 'Adley, A.H.'.

52 Talmey, op. cit. (15), p. 393. See also Max Talmey, 'Notes on a model language', *Scientific Monthly* (April 1929) 28, pp. 330–5; and Talmey, 'Word composition in a logical language', *Modern Language Journal* (December 1930) 15 (3), pp. 200–14. In 1925, when he first articulated the concept, he called it UL (universal language). Talmey, op. cit. (30), p. 43.

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for people able to communicate ideas of real value'.[53] One such idea was Einstein's theory, and the association between the two was so tight that he occasionally chafed against it, cautioning one journalist not to harp too often on 'a connection between Arulo and the Einstein theory. It creates the impression that the former was devised almost entirely for the sake of the latter'.[54]

Some of his early arguments about the linguistic handicaps of standard presentations of relativity hinged on classic IL postulates, which often doubled as denigrations of German. In the early 1920s, Talmey insisted that Einstein's theory was slow to universal acceptance because it 'was misunderstood by all except those with a full command of German'.[55] This point was singled out for emphasis in *The Relativity Theory Simplified*, with a dash of his onetime enthusiasm for radio:

> Professor Einstein offers the best illustration for the need of a medium of communication for the interchange of ideas of moment between people of different mother tongues. He lectures and broadcasts in German to the great disadvantage of those unfamiliar with this language. This difficulty for listeners in lecture halls and at radio receivers would be obviated by a language fully adequate and acquirable in a few months by an intelligent person.[56]

It was but a short hop from the limitations of German to the limitations of English. After the appearance of a puff piece about his language in *Time*, he pitched its sister magazine *Life* on a translation of Einstein's 1939 World's Fair lecture on cosmic rays, an ideal subject for illustrating the significance of Gloro.[57]

More crucial was what Einstein could do with an ML: 'he could communicate his ideas to us almost as well as with his mother tongue and in some instances even better, and in all instances far better than with a natural language foreign to him'.[58] The problem was not that outside the model language inadvertent confusions could creep in. Talmey's most important example was the expression 'four-dimensional'. This term was bound to cause confusion, when all it really meant was 'pertaining to four variables', where time (t) was a variable required for the full characterization of a phenomenon, alongside the three variables associated with space. Ordinary languages, including German and English, hereupon encountered a problem that Gloro avoided:

> In Arulo, the basis of the Model Language (not to be confused with International Language which cares little for strict rationality), the two nouns discussed above are: dimensiono, dimension; varieblajo, a variable. Adjectives are formable from both in the same way: quar-dimensional, four-dimensional; quar-varieblajal, pertaining to four variables. The last adjective is the one which is needed for a smooth presentation of Minkowski's 'World' but does not exist in a convenient form in the natural languages. The relativity theory can be explained to a layman in Arulo better than in a natural language and to a mathematical student at least as well.[59]

53 Talmey to Don A.D. Boyer, 30 July 1929, Talmey Papers, Box 2, folder 'Boyer, A.D.'.

54 Talmey to Walter Modell, 16 August 1938, Talmey Papers, Box 11, folder 'Walter Modell'.

55 'Universal languages: do you speak Ido?', *South China Morning Post*, 17 January 1924, p. 11. See also Talmey, op. cit. (24), p. 342.

56 Talmey, op. cit. (2), pp. 174–5. See also Talmey, op. cit. (13), p. 387. Ignorance of German was not an especially severe problem in the interwar scientific world. Gordin, op. cit. (22), Chapter 6.

57 Talmey to editor of *Life* magazine, 25 June 1939, Talmey Papers, V27, Box 6, folder 'Life'. The *Time* piece was 'Gloro', *Time* (5 April 1937) 29(14), pp. 29–30.

58 Talmey, op. cit. (2), p. 176.

59 Talmey, op. cit. (47), p. 256; Talmey, op. cit. (2), pp. 103–4. Ironically, this same feature can easily be employed in Esperanto.

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Talmey made a similar argument about 'space curvature' as an unfortunate linguistic workaround, in German, to nominalize 'non-Euclidean'.[60] These might seem trivial matters, but when it came to describing Hermann Minkowski's 'absolute world', expressions of multiple 'dimensions' for 'the layman ... comprise something weird, savor of mysticism, and are confusing'.[61] And not just for the layman. He repeatedly claimed that '[m]ystically inclined physicists' – presumably he had in mind Arthur Stanley Eddington's enormously influential popular accounts of relativity –

> have made the theory unintelligible. Their writings on it, distinguished through an eminently literary style and poetic analogies, appeal to many, and editors favorable to mystics seem to value those enigmatic writings higher than the admirably lucid new exposition of the theory by its inventor. This is in harmony with our age of unreason, with the modern tendency to elevate the unconscious, the vague, the unreasonable above the conscious, the clear, the rational.[62]

That these arguments used the exposition of relativity as a justification for Gloro reveal an important aspect of Talmey's philosophy of language that bears on the question of 'linguistic relativity': his lexical focus. For Talmey, the most important elements of language were the individual words (as opposed to, say, syntax). In each of the languages he studied, Talmey was consistently struck by the same phenomenon: 'many conceptions could be expressed by a single word in one language and only by circumlocution in the other'. In principle, this could provide a way of ranking languages: a language with the richest lexical stock, the greatest ability to express single concepts in single words, was simply 'better'. Yet in the six languages he had learned by the age of eighteen, he found the same pattern repeating: 'the occasional necessity of a circumlocution in one language where a single word sufficed in another, that is, in every language there was want of expressiveness in certain instances'.[63]

Had he stopped here, Talmey might seem close to Whorf's linguistic relativity: every language is just as good (and just as bad) as any other, in terms of grasping the world. But Talmey was rather more judgemental.[64] While no extant language had a single word for every concept expressed by a single world in every other language, he believed that English was 'far richer, far more expressive than any other language. Far more often than with any other tongue one meets, in a comparison pertaining to expressiveness, with concepts each expressible in English by a single word and only by a circumlocution in any other language'.[65] What was lacking in English was the 'great expressiveness in [ancient] Greek' which stemmed from 'the excellent capability to form compound words, which capability is almost entirely lacking in Latin ... The modern Romance languages inherited

60 Talmey, op. cit. (47), p. 257; Talmey, op. cit. (2), pp. 105, 134–5.

61 Talmey, op. cit. (2), p.102. Although Talmey almost certainly did not realize this, Einstein had his own reservations about overly geometrical thinking with respect to relativity. See Dennis Lehmkuhl, 'Why Einstein did not believe that general relativity geometrizes gravity', *Studies in History and Philosophy of Modern Physics* (May 2014) 46(B), pp. 316–26.

62 Talmey to editor of the *Herald-Tribune*, 28 April 1938, Talmey Papers, Box 4, folder 'Herald Tribune'. For a discussion of Eddington's popular representation of relativity, as well as ascriptions of 'mysticism', see Matthew Stanley, *Practical Mystic: Religion, Science, and A.S. Eddington*, Chicago: The University of Chicago Press, 2007.

63 Talmey, op. cit. (13), p. 386.

64 In some cases, egregiously so: 'Such jargons are the Lingua Franca used on the Mediterranean coast, Chinook in the region of the Columbia River, and pidgin-English on the Chinese coast. Such jargons do not represent progress, but regression to barbarity'. Talmey, 'Logical shape of the auxiliary international language', op. cit. (26), p. 9.

65 Talmey, 'The auxiliary language question', op. cit. (23), p. 174; Talmey, 'Logical', op. cit. (27), p. 2.

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from Latin this incapability to form word-compositions', and English and German could do so only partially.[66] By combining English's lexical hyperfecundity with flexible word composition, one approached the model language.

Talmey was convinced he could prove that the model language (i.e. Gloro) was the best – meaning most efficient – language through translation 'experiments'. As Talmey articulated the procedure in 1938: 'Of two languages that one is more efficient by means of which one can translate more faithfully an original composed in a third language. The faithfulness of a translation is determined by the approximation to the original of a retranslation into the original language.'[67] He had been working with this criterion since his Ido years, appending to his articles a series of translations from French, English, German and other languages into Ido/Arulo/Gloro (and, for invidious comparison, also Esperanto) to show how the back-translation was easiest for his favoured language. Consistent with his almost exclusive focus on lexemes, he emphasized word-by-word translation, even for idioms, which enabled a simple back-translation familiar to those today who use online translation programs.[68] This was not only a criterion for efficiency, but also for 'faithfulness', 'determined by the approximation of the retranslation to the original. This criterion is verifiable by an experiment'.[69] The reasoning here is not dissimilar from Minkowski's: just as there is a worldline that fully characterizes an event in four dimensions while individual observers may locally disagree about simultaneity, so there was a true meaning of any text that could be expressed despite the divergence of local translations into various ordinary languages. The equivalent to the absolute world was the model language: Gloro, the Einsteinian tongue.

Albert and Max

In addition to coveting the prestige of Albert Einstein's theory of relativity for Gloro, Talmey also wanted the endorsement of Albert Einstein himself. This was not an entirely utopian aspiration, since the two had met long before Talmey's linguistic excursions, and had maintained a significant connection. The canonical source on their relationship is a biographical sketch penned by Einstein's sister, Maja Winteler-Einstein, in 1924, describing the physicist's Munich boyhood:

> A poor Jewish medical student of Polish nationality, whom the Jewish *Gemeinde* had provided with a free dinner at the Einsteins, gave [Albert] an impulse to [science] & in this manner repaid with intellectual excitement what he received in material

66 Talmey, *Filologiala*, op. cit. (27), p. 9: 'Ca granda expresiveso en la Greka esas produktata grandaparte per l'ecelanta kapableso formacar kompozita vorti, qua kapableso preske tote mankas a la Latina ... La moderna lingui Romanala heredis de la Latina la nekapableso formacar vortkompozuri.'

67 Talmey, 'The auxiliary language question', op. cit. (23), p. 181. See also Talmey to editor of the *Herald-Tribune*, 23 February 1941, Talmey Papers, Box 4, folder 'Herald Tribune'.

68 Talmey, *Lektolibro*, op. cit. (27), p. 22: 'La precipua postulo en tradukuri esas intelektebleso generala (internaciona). Vortopa tradukuro di pura (evidenta) idiotismi ne povas komprenesar da altru kam ta qua parolas la linguo dil originalo. Pro to pura idiotismi absolute mustas tradukesar en irga logikala maniero. Ma existas en omna linguo expresuri, quin me nomizis "expresuri kelki idiotismala", c.e. generale intelektebla en vortopa traduko. Tradukante li logikale on privacas la tradukuro de la beleso dil originalo. La naturala lingui obtenas sua charmi per sua partikularaji e per sua mikra deviaci de la logiko. Tro multa logiko enoyigas. En tradukuri on esforcez do imitar l'originalo maxim fidele posible. La limito, til qua on povas irar, esas donita per l'intelektebleso generala (internaciona). Ca tradukmaniero ofras duopla avantajo. Ol esas plu facila kam traduko strikte logikala, quan mem kapabla skribero ofte trovas nur os penoza meditado, kontre ke la vortopa traduko esas quik donita. L'ara neevaluebla avantajo di ica esas, ke ol igas un naciono konocar la spirito di la linguo di altra naciono, e per to ulmezure anke lua pensmaniero.'

69 Talmey, 'Notes on a model language', op. cit. (52), p. 334.

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> welfare. He introduced the boy into the world of philosophical thought. He talked through with him all the questions the knowledge-hungry youth threw at him, and recommend to him the reading of natural-philosophical books (*Kraft und Stoff* by [Ludwig] Büchner, *Kosmos* by [Alexander von] Humboldt, the popular natural science books from [Aaron] Bernstein etc.) Apart from that [Talmey] treated the boy, despite the difference in ages, like one of his fellows.[70]

The medical student was Max Talmey – at that time still surnamed 'Talmud'. The story is recounted in almost exactly these terms in every biography of the scientist, and has also spawned a complement of feel-good pieces designed to encourage individuals to mentor curious youth.[71]

A more thorough account occupies Part III of Talmey's *The Relativity Theory Simplified*.[72] His brother Bernard's visits to the Einsteins as a poor student had begun when Albert was eight years old, and Max followed in his footsteps in the fall of 1889, when the boy was ten and a half. 'Although Albert was eleven years younger than the medical student, close fellowship soon developed between them, due to the young boy's exceptional intelligence which enabled him to discuss with a college graduate subjects far above the comprehension of children of his age', recalled Talmey in 1932. 'He showed a particular inclination toward physics and took pleasure in conversing on physical phenomena.' Talmey mentioned Bernstein's enormously successful popular-science treatises and Büchner's controversial but more dated materialist tract as especially significant.[73] Perhaps even more important was the gift of Theodor Spieker's *Lehrbuch der ebenen Geometrie*, which introduced the boy to the rigid logic of Euclidean proofs. When Einstein had worked through these problems and moved on to harder material beyond Talmey's capacity, the latter 'recommended to him the reading of Kant. At that time he was still a child, only thirteen years old, yet Kant's works, incomprehensible to ordinary mortals, seemed to be clear to him'.[74] Historian Ze′ev Rosenkranz marks this interaction as filling 'a crucial emotional role for the young Einstein', and it shaped his decision, at age twelve, to forgo a bar

70 Maja Winteler-Einstein, 'Albert Einstein: Beitrag für sein Lebensbild', in John Stachel *et al.* (eds.), *The Collected Papers of Albert Einstein*, vol. 1: *The Early Years, 1879–1902*, Princeton, NJ: Princeton University Press, 1987, pp. xlviii–lxvi, lxii.

71 For a selection of the biographies, which do not always name Talmey/Talmud, see Fölsing, op. cit. (12), pp. 21–2; Anton Reiser [Rudolf Kayser], *Albert Einstein: A Biographical Portrait*, New York: Albert & Charles Boni, 1930, p. 36; Jürgen Neffe, *Einstein: A Biography* (tr. Shelley Frisch), New York: Farrar, Straus & Giroux, 2007 (first published 2005), p. 50; and Carl Seelig, *Albert Einstein: Leben und Werk eines Genies unserer Zeit*, Zurich: Bertelsmann Lesering, 1960, p. 15. For the heartwarming variants see Bea Stadtler, 'For the young reader', *Jewish Advocate*, 4 January 1973, p. 14; and Jim Daly, 'One of the most influential people you've never heard of', *Focus on the Family*, blog, 24 January 2013, at http://jimdaly.focusonthefamily.com/one-of-the-most-influential-people-you-39-ve-never-heard-of (accessed 30 August 2021). The second of these is particularly ironic, coming from an evangelical organization, since Talmey's mentoring alienated young Albert from his interest in religion.

72 Three years earlier, in 1929, Talmey had tried to publish his reminiscences in the *Saturday Evening Post* as a four-thousand-word story entitled 'The story of Einstein's life: reminiscences of his boyhood and youth, the author's influence on his development, and outline of a brilliant career', but was unsuccessful. Talmey to editor of the Hearst Corp., *Saturday Evening Post*, 24 January 1929, Talmey Papers, Box 4, folder 'Hearst's International (Einstein)'. He succeeded in placing it in the *New York Times* instead: 'Einstein as a boy recalled by a friend', *New York Times*, 10 February 1929, p. 145. He also gave a public lecture on these stories to celebrate Einstein's fiftieth birthday later that year: 'Einstein honored on his 50th birthday', *New York Times*, 17 May 1929, p. 24.

73 Talmey, op. cit. (2), p. 162. On the Bernstein books see Frederick Gregory, 'The mysteries and wonders of natural science: Aaron Bernstein's *Naturwissenschaftliche Volksbücher* and the adolescent Einstein', in Don Howard and John Stachel (eds.), *Einstein: The Formative Years, 1879–1909*, Boston: Birkhäuser, 2000, pp. 23–41.

74 Talmey, op. cit. (2), p. 164.

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mitzvah and set aside his earlier interest in Jewish tradition.[75] Shortly after their Kantian discussions, Talmey graduated from medical school and emigrated to the United States, while Einstein completed *gymnasium* in Munich and followed his family to Italy, where they had settled following the failure of Hermann Einstein's electrotechnical business.

When Talmey learned about the existence of the theory of general relativity from the media fanfare in 1919, and realized that this Einstein was the same as his boyish friend, his interest in the theory and its author intensified. When Einstein and his second wife Elsa (whom Talmey had also known in Munich) visited New York City in spring 1921, the three became reacquainted, although Talmey's accounts are inconsistent about whether this was in a hotel or at Talmey's home.[76] They reminisced about the books Talmey had given him, and it set the foundation for future conversations.

Those could only really continue after Einstein had moved to the United States in 1932, at first for a year of sabbatical at Caltech, but eventually for good due to Adolf Hitler's seizure of power in spring 1933. Einstein settled at the newly founded Institute for Advanced Study in Princeton, New Jersey, a relatively short distance from Talmey's New York residence. They did not see each other often, but relations were cordial. For example, when the Talmeys visited the Einsteins in Princeton in 1938, the physicist sent Mrs Talmey a poem to thank her for the cake she had brought:

> Was Du erwirbst aus eigner Kraft
> Nur mässiges Pläsir verschafft.
> Vollkommener ist das Vergnügen
> Wenn wir was Unverdientes kriegen.
>
> So war es auch in Ihrem Fälle
> Und ist der Kuchen auch schon alle
> So bleibet doch im Herzen drin
> Die Freude an der Spenderin.[77]
>
> (What you earn by your own power
> Does with only moderate pleasure shower.
> The satisfaction is more perfect
> When we something undeserved collect.
>
> So was it also in your case
> And the cake is already laid waste.
> But there remains in the heart's interior
> The joy toward the donor.)

Doggerel was a favorite form of friendly expression for Einstein, as in the poem he sent Max Talmey thanking him for remembering the scientist's fiftieth birthday. Talmey promptly had it printed in the *New York Times*.[78]

75 Ze'ev Rosenkranz, *Einstein before Israel: Zionist Icon or Iconoclast?*, Princeton, NJ: Princeton University Press, 2011, pp. 19–22, 21. Rosenkranz also notes that the Talmeys were likely the first *Ostjuden* that Einstein had met. Ruminations on the *Ostjuden* and their divergence from secularized German Jews was central to Einstein's own understanding of anti-Semitism. For a more general treatment of this topic, see Steven E. Aschheim, *Brothers and Strangers: The East European Jew in German and German Jewish Consciousness, 1800–1923*, Madison: University of Wisconsin Press, 1999.

76 Talmey, op. cit. (2), pp. 163, 173–4.

77 Albert Einstein, 'Dank an Frau Helen Talmey für einen Kuchen' [1938], Albert Einstein Archives, Givat Ram campus of the Hebrew University of Jerusalem, Israel (hereafter Einstein Archives), 54–542.

78 'Professor Einstein pens a poem', *New York Times*, 21 April 1929, p. 143.

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Talmey sent the physicist a copy of *The Relativity Theory Simplified*, hoping that both the reminiscences and the account of relativity would please him. They did. 'I enjoyed how fundamentally you concerned yourself with the conceptual basis of Relat. Theory', Einstein wrote Talmey in January 1933. 'I really believe that your book can bring the theory closer to many intelligent educated people who do not wish to penetrate deeply into its mathematical basis.'[79] Einstein had a high enough opinion of Talmey's grasp of the theory, and his ability to explain it to others, that he referred at least one popular reader to his former mentor.[80] Einstein was especially fond of the recollections in the book: 'it all became alive again for me in the reading'.[81] As pleasing as these endorsements obviously were, they were not all that Talmey had hoped for. Besides the biographical recollections and the popular science, *The Relativity Theory Simplified* also advocated for the model language as a mode of communication in science. That was the endorsement that he really coveted.

He was not the only one. For many years, advocates for various constructed languages had sought to obtain the imprimatur of the world's most famous scientist. The Esperantists tried first and had the greatest success. In 1923, upon receiving an invitation to an Esperanto congress in Kassel, Einstein agreed 'that you make me an honorary president [*in absentia*] of your congress, I thank you for the statement of sympathy, and I wish your enterprise the best success'.[82] Several who knew him in the 1920s understood the physicist to be friendly to the language, or at least to its goals. Konrad Wachsmann, the architect of Einstein's country house in Caputh, outside Potsdam, recalled, 'Einstein imagined an official language for the whole world. Zamenhof's Esperanto, for example. All other languages would continue to exist, and the cultures likewise.'[83] Einstein's housekeeper also recalled many years later that Esperanto was often discussed at his Haberlandstraße apartment in Berlin, and that 'the Professor was very strongly interested in it', but she did not know whether he spoke it.[84]

Based on the Kassel meeting, in 1949 Dr William Solzbacher, president of the Esperanto Association of North America, asked Einstein to sign a petition (that already had 895,432 individual signatures and an additional 15.5 million members of organizations) to the United Nations to consider the international-language question.[85] Einstein's response was quite brusque: 'I do not recollect having been Honorary President of the Esperanto Congress at Cassel 1923. In fact, I was never interested in the attempt to introduce an artificial language, believing that the obstacles outweigh the advantages of such an enterprize [*sic*].'[86] Twenty-five years had dulled his memory, perhaps, but one might also consider two additional considerations that might have soured him on these matters.

The first was an inquiry by an Esperantist in 1931 about whether there was any truth behind the announcement by the Anglic Society of Berlin – Anglic was a project based on

79 Albert Einstein to Max Talmey, 21 January 1933, Einstein Archives, 120–359.

80 C.H. McGlasson to Talmey, 17 October 1940, Talmey Papers, Box 6, folder 'C.H. McGlasson (Einstein)'.

81 Einstein to Talmey, 21 January 1933, Einstein Archives, 120–359.

82 Reproduced in E. Lanty, 'Albert Einstein, 1879–1955: Honora prezidanto de la 3-a SAT-Kongreso aŭgusto 1923 – en Kassel (Germanio)', *Sennaciulo* (April 1993) 64(4) (1054), pp. 37–8, 38.

83 Quoted in Michael Grüning, *Der Architekt Konrad Wachsmann: Erinnerungen und Selbstauskünfte*, Vienna: Löcker Verlag, 1986, p. 132. In context, it seems that Einstein's model was how English functioned in the multicultural United States. See also Detlev Blanke, 'Albert Einstein über eine internationale Sprache', *Esperanto aktuell* (2005) 6, pp. 18–19.

84 Quoted in Friedrich Herneck, *Einstein privat: Herta W. erinnert sich an die Jahre 1927 bis 1933*, Berlin: Buchverlag Der Morgen, 1978, p. 107.

85 William Solzbacher to Albert Einstein, 21 October 1949, courtesy of Detlev Blanke (copy in author's possession).

86 Einstein to Solzbacher, 26 October 1949, courtesy of Detlev Blanke (copy in author's possession).

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English but with standardized spelling – that Einstein was an honorary member. Einstein reassured her that there was not. 'It is also very unpleasant to me that my name is being brought together with the Anglic movement. This happened not entirely without my own fault, since I have expressed myself favourably about the plan', he responded. 'In fact I must declare that I understand too little of these linguistic problems to be able to make a judgment. Therefore it is obligatory to leave this to be decided by those capable of judging. I will in the future abstain from expressing any opinion.'[87]

The second was Max Talmey. His former mentor tried several times to interest Einstein in the question of constructed languages. The issue clearly came up in their 1921 conversations, since in 1925 Talmey told readers of the *Wireless Age* that although Einstein in general thought some kind of auxiliary international language might be a good idea, he 'has never endorsed any special system offered as solution of its problem for the simple reason that he has no time to make himself acquainted with any system and he is not the man to give an opinion on a subject which he does not know thoroughly'. In particular, rumours that Einstein endorsed Esperanto were calumnies.

> That eminent scientist would hardly put the stamp of approval upon a system that he does not know, especially after his intimate early friend, whom he knows as a painstaking student of the AIL [auxiliary international language] problem, has described to him that system as being unfit for the role of the AIL.[88]

Talmey held out hope in early 1933, immediately after Einstein's praise for the other parts of *The Relativity Theory Simplified*, that perhaps Einstein would now support a better project. He was disappointed: 'I read your publications about an international or, better, about a rational auxiliary language with much interest', wrote Einstein. 'I am thereby convinced that the publication of your detailed book about this matter would be very desirable and would find great interest among all those who stand close to this problem.'[89]

This was not quite the ringing endorsement he had hoped for, but Talmey still used it.[90] He tried again. On 24 March 1937, he gave a reprise of a lecture he had just delivered at Yale University – which linguist Edward Sapir had attended – to the Jewish Club at 23 West 73rd Street in Manhattan, arranging the time of the presentation so that Einstein would be able to duck in after a conflicting fundraising event for the Hebrew University at the Waldorf Astoria. Talmey made sure the *New York Times* knew about Einstein's attendance.[91] Two years later Einstein did write a letter offering mild compliments to Gloro, but it was too mild for Talmey's purposes, and Einstein never picked up the question again.[92]

Whorf approaching the speed of light

The term 'linguistic relativity' does not, as a rule, conjure up Max Talmey; it is, however, rather tightly identified with Benjamin Lee Whorf. In his famous 1940 *Technology Review*

87 Reproduced in D.E.B., 'Anglic', *Germana Esperantisto* (1931) 11, p. 165.

88 [Talmey], 'Did Prof. Einstein endorse any international language system?', *Wireless Age* (July 1925) 12, p. 38.

89 Einstein to Talmey, 17 March 1933, Einstein Archives, 71–771.

90 Talmey to Morris Cohen, 10 February 1933, Talmey Papers, Box 2, folder 'Cohen Morris R.'.

91 'New world tongue in [*sic*] introduced here', *New York Times*, 25 March 1937, p. 27. On the complex arrangements of the schedule to accommodate Einstein see Talmey to Lucius N. Littauer, 21 January 1939, Talmey Papers, Box 6, folder 'Littauer, Lucius N.'.

92 Talmey to Einstein, 9 February 1939, Einstein Archives, 54–543. See also the elaborate hermeneutics parsing Einstein's statements in Talmey to Joseph Davidson, 17 February 1939, Talmey Papers, Box 3, folder 'Davidson, Joseph'.

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article 'Science and linguistics', he laid the cornerstone of his approach to language on 'a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated', easily accomplished when most of the world's science was conducted in Indo-European languages (English, French, German, Latin, Russian), which parsed the world in analogous ways. Scientific objectivity could thus be considered an illusion produced by coordination of non-Indo-European scientists' world views with those of their European counterparts, not a reflection of the world itself: 'That modern Chinese or Turkish scientists describe the world in the same terms as Western scientists means, of course, only that they have taken over bodily the entire Western system of rationalizations, not that they have corroborated that system from their native posts of observation.'[93]

Whorf's linguistic relativity is one of the most controversial ideas in twentieth-century linguistics, and it is not the purpose of this article to adjudicate its validity.[94] My focus is rather Whorf's choice of 'relativity' to identify his hypothesis. This was not simply an idea 'in the air', but one that Whorf turned to deliberately again and again in both his publications and his voluminous manuscripts.

For Whorf, relativity physics was both indicative of the Indo-European ethnocentrism of contemporary science and an inspiration to think beyond it. On the one hand, he argued that 'relativity has such a basis in the western Indo-European languages (and others) – the fact that these languages use many space words and patterns for dealing with time'.[95] On the other hand, as he wrote to Irving Peskoe of his alma mater, MIT, Einstein's approach was more suggestive as metaphor:

> It is especially enlightening as to the way in which our thought processes and principles of logic and ideas of reality are at bottom systems of linguistic reference, characteristic not of the human race but only of certain familiar languages or families of languages, existing side by side with any number of alternative systems of very different character yet equally precise, intelligent, consistent, and workable. In this respect linguistics is like relativity or quantum theory: it is a detached viewpoint, a new vista, a critique of all our 'classical' thinking and unconscious assuming, very demolishing in some respects, but exceedingly constructive and inspiring of new conceptions in others.[96]

One way to read this, according to later commentators, is that Whorf's

93 Whorf, op. cit. (1), p. 274.

94 Much of the debate about Whorf within his own adopted discipline has taken the form of empirical laboratory or ethnographic studies, most often using colour terminology to see whether perception was in fact shaped by linguistic categories. This has been a fertile area for discussions of proper experimental method, but even his supporters concede that a conclusive consensus has not emerged after decades of research. See John A. Lucy and Richard A. Shweder, 'Whorf and his critics: linguistic and nonlinguistic influences on color memory', *American Anthropologist* (September 1979) 81(3), pp. 581–615; Paul Kay and Willett Kempton, 'What is the Sapir–Whorf hypothesis?', *American Anthropologist* (March 1984) 86(1), pp. 65–79; Earl Hunt and Franca Agnoli, 'The Whorfian hypothesis: a cognitive psychology perspective', *Psychological Review* (1991) 98(3), pp. 377–89; and Lera Boroditsky, 'Does language shape thought? Mandarin and English speakers' conceptions of time', *Cognitive Psychology* (2001) 43, pp. 1–22.

95 Whorf, op. cit. (1), p. 340.

96 Benjamin Lee Whorf to Irving Peskoe, 16 April 1939, Benjamin Lee Whorf Papers, MS 822, Special Collections, Sterling Memorial Library, Yale University, New Haven, CT (hereafter Whorf Papers), Reel 1. At MIT, Whorf concentrated on chemistry, and it is unclear how much about relativity he would have learned in a classroom context. Roald Hoffmann and Pierre Laszlo, 'Benjamin Lee Whorf: once a Chemist …', *Interdisciplinary Science Reviews* (2001) 26(1), pp. 15–19.

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> point is a *logical* one; from the point of view of the way the world *presents* itself, all things are equally alike and equally different, that is, the number of true things one can say about any two things (the number of predicates that apply) are equal, and perhaps infinite.[97]

An unpublished manuscript of a novel/theological treatise in Whorf's archives, entitled 'The ruler of the universe' – a double entendre on God and measurement – indicates that Whorf took the precepts of relativity more literally. The novel is undated but likely originated in the late 1930s, roughly around the time when Whorf began to articulate 'linguistic relativity' more precisely. The book traces the religious contemplations of John Landon, who early in the text is gripped by a strange dream that filled him with wonder. 'Half the time', Landon related to his spiritual guide, the Reverend Allen Chase,

> It seemed that I was small and the Universe big, and the other half it seemed that I was big and the Universe small ... I did not really know whether I was moving, or expanding, or Space was contracting, or Time was contracting, or my time-sense was expanding – all these seemed one and the same, different only as ways of naming.[98]

Chase immediately responded, 'The most striking example of this that occurs to me at this instant is Einstein's Special Theory of Relativity.' When Landon asked for clarification, Chase proceeded to expound:

> Well, it's not as hard work as some people make of it. In simple language it boils down to this:
>
> Idea A is that motion at a constant speed without any rotation is relative. That is, you can't tell if a thing is moving in this way unless you compare it with something else. This is an idea that appears self-evident; it is the kind of idea that is often called 'just ordinary common sense'. Moreover, it can be shown that it is the same as saying that the laws of Nature if properly stated need not vary between different bodies having such motion, which is a valuable thought to the scientist.
>
> Therefore, says Einstein, this idea A is a fine idea; let us retain it.
>
> Idea B is that the measurements of the velocity of light give a constant figure regardless of the observer's state of motion[.] There is no choice about retaining this idea; it has been established by many careful experiments, therefore we must retain it.
>
> Now by taking these ideas A and B as postulates and reasoning mathematically from them it can be shown that objects alter their length as their state of motion changes with respect to the observer, and it becomes further evident that the observer could not detect this alteration in length because if he undertook to measure or compare a moving object his measuring rod or standard would share in the motion and so undergo a proportionate alteration. In brief, we have obtained the result that the length of bodies is affected by their motion but that this effect cannot be detected. It can also be shown from these two principles A and B that time runs

97 Lucy and Shweder, op. cit. (94), p. 602, emphasis in original. See also Deborah Cameron, 'Linguistic relativity: Benjamin Lee Whorf and the return of the repressed', *Critical Quarterly* (1999) 41(2), pp. 153–6, 154; and Herbert Hackett, 'Benjamin Lee Whorf', *Word Study* (February 1954) 29(3), pp. 1–4, 3.

98 Whorf, 'The ruler of the universe', Chapter 4. 'Certain things considered', undated manuscript, Whorf Papers, Series II, Box 1, Folder 1, p. 71.

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> faster or slower in accordance with the motion of bodies and that this also cannot be detected.[99]

Seeking further enlightenment, the novel describes Landon writing to an 'expert on time', the scientist Leonard Murchison, who confirmed Chase's precis:

> Time varies as we move relatively to this and that. The man on a speeding express train is not in quite the same world of Time as the man on the ground, though it is just the same to him because the *relative* status of motions in his little world on wheels is unaltered.[100]

Murchison's trains and watches likely stemmed from Einstein's 1916 popular account, *Relativity: The Special and the General Theory*. For Landon, the centrality of light brought to mind the creation story in Genesis, and also the Michelson–Morley experiment.[101] From here the discussion ranged into other domains, but relativity continued to crop up, often blurring between the technical interpretation and a more general 'relativity of truth', in which 'different descriptions of the same facts [are made] equally true in different spheres of relativity'.[102]

Whorf was a polymathic autodidact, and drew from multiple sources in his thought, especially Theosophy; Einstein's relativity is not a universal decoder ring for his ideas.[103] Equally central are Whorf's personal theories of how to bring science and religion together. Yet even in a manuscript like 'Why I have discarded evolution: a critique of the evolution concept', which he sent to leading geneticist Thomas Hunt Morgan, relativity still served as a totem of potential revolution. After all, if relativity could show that our established concepts can be overthrown, why might that not happen to Darwinism?[104] (Surprisingly, Morgan took the trouble to respond and mark up the first few pages of the manuscript; unsurprisingly, he dismissed the argument.[105]) Although it obviously had its limits, the persistence of Einsteinian relativity as principle, as metaphor and as touchstone shows the seriousness of Whorf's engagement with Einstein, suggesting an unexpected resource for the creation of 'linguistic relativity'.

Conclusion

The central inspiration Whorf drew from relativity theory was that different reference frames could fundamentally disagree in their descriptions of nature. Reappropriating that notion in linguistic terms as the incommensurability of different grammars, with the additional assumption that grammars isomorphically mapped onto world views (e.g. our notions of time are conditioned by tenses), he crafted the gulfs as revolutionary divides. Each tongue was isolated and equivalent to all the others; you could coordinate among the differences, but not eradicate them. This is a view of Einstein's theory that seizes fully upon its 'relative' aspects. Talmey, by contrast, focused on words (or, in

99 Whorf, op. cit. (98), pp. 17–18.

100 Whorf, op. cit. (98), p. 75, emphasis in original.

101 Whorf, 'The ruler of the universe', typescript, p. 37.

102 Whorf, op. cit. (101), p. 242.

103 His manuscripts also contain heterodox theories of gravity and light expansion: 'Flux outlet theory: a concrete representation of gravitation', and 'Light velocity and expansion', both undated, Whorf Papers, Reel 5.

104 Whorf to Thomas Hunt Morgan, 25 October 1925, Whorf Papers, Reel 5.

105 The letter concludes, 'I hope you will pardon me when I add that most of your discussion handles the problem as it stood during the end of the last century, and earlier, and not as it appears to zoologists of the present time'. Morgan to Whorf, 19 November 1925, Whorf Papers, Reel 5.

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linguists' terms, the lexicon) rather than the syntactic affordances of grammar. His gradualist efforts in adapting Gloro out of the structures of Esperanto and Ido involved primarily a massive expansion of the lexicon in order to overcome precisely the kinds of incommensurability produced by different grammars. This reformist approach to communication emphasized the 'invariance' lessons of Einstein's relativity theory: that the world being described was the same, despite disagreements among local accounts, and that switching to a different coordinate frame (Gloro) would produce transparency. Both seized either lexicon or grammar and with it engulfed the other, and both did so through literal and metaphorical appropriations of Einstein's ideas.

For Whorf, the connection to Einstein's physics is direct, and made explicit in Whorf's unpublished theological novel 'The ruler of the universe': all phenomena are relative to our linguistic frames of reference, just as all events are relative to the inertial frames of reference (train, rocketship, elevator) in Einstein's theory. That, however, is where the extrapolation stopped. There is no absolute world that we can extract from these various linguistic reference frames. We have to remain at the level of the frames of reference, and thereby recognize the epistemic legitimacy of sciences generated by those who think in other tongues.

For Max Talmey, on the other hand, the 'model language' produced as close a mapping as possible between our scientific categories and our linguistic ones, abstracting gradually from various defunct international-language projects until asymptotically approaching the perfection of Gloro. This is language as Minkowskian worldline: the descriptions are as close as we can get to reality, something that you can test with translational 'experiments'. This, too, is a kind of 'linguistic relativity', but it is one based on a strict reading of Einstein's physics and buttressed by Talmey's confidence born of his decades of acquaintance and friendship with the legendary scientist.

The tension between Whorf and Talmey is one we find throughout the entire history of interpretations of relativity theory, where especially (but not exclusively) popular understandings either draw heavily on the 'everything-is-relative' or the 'deeper-truth' strands of Einsteinian reasoning. The term 'linguistic relativity' has been planted fairly firmly in the camp of the former, but Talmey's case – and even his failure to get Albert Einstein himself to endorse the theory – illustrate that the fruitfulness of the relativity metaphor allowed for both variants. Bringing Talmey into a juxtaposition with Whorf shows that there is nothing inevitable about the mapping between relativity in physics and Whorfian linguistics. Other appropriations existed in the same conceptual context, even though only Whorf's outlived the death of its creator. Any future account of the reception history of Whorf's version ought to equally explain the eclipse of Talmey's interpretation, particularly given the significance of the personal relationship between Talmey and the author of relativity theory.

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