

Language as the Foundation of “Dasein”

Filip Świerczyński, The University of Warsaw, Poland

The Asian Conference on Language 2022
Official Conference Proceedings

Abstract

Metacognition, together with anthropolinguistics, evolutionary psychology, and philosophy, have for years postulated a scientific consideration of the interrelationships between language and the self-awareness of a being in relation to its existence. Recognizing one’s own existence “in” and “in relation to” the world can be described as Heideggerian *Dasein*. Theories of consciousness formulated within the framework of discourse are forced to adopt anthropocentric optics—a classic and popular emanation of this paradigm of thought in the field of artificial intelligence research is Turing’s Imitation Game. The current state of knowledge concerning the evolutionary development of human self-awareness and language as a phenomenon, as well as the consideration of various types of hypothetical para-consciousness in selected animal species, leads us to the conviction that there is a close relationship between the potential or the ability to use language as an advanced system of signs and the evolutionary development of *Dasein*. The ability to understand and use advanced language systems is, in this perspective, a prerequisite for going beyond the sphere of para-consciousness (i.e., primary consciousness), which demonstration should find its application, inter alia, in the development of artificial general intelligence (AGI), including advanced social robots.

Keywords: Language, Consciousness, Awareness, Understanding, *Dasein*, Heidegger, Linguistics, Cognitive Science, Anthropology, Philosophy, Artificial Intelligence, AI, Imitation Game

iafor

The International Academic Forum

www.iafor.org

The origin of human language must, more than anything else, have had an ennobling and transforming influence upon the mental life of Man, and consequently upon his brain. The higher differentiation and perfecting of the brain and mental life as its highest function developed in direct correlation with its expression by means of speech. Hence, the highest authorities in comparative philology justly see in the development of human speech the most important process which distinguishes Man from his animal ancestors.

— Haeckel, E. (1880). *The History of Creation* (Vol. II) (E. R. Lankester, Transl.). New York: D. Appleton and Company, 302.

Introduction

The phenomenon of consciousness in the context of contemporary scientific and philosophical discourse can generally be considered in two ways: either materialistically-physicalistically, as a currently unattainable resultant of a series of neuronal processes¹ occurring within the limits of a dispersionally complex and advanced brain architecture (Dennett, 1991; Eccles, 1992, pp. 7320–7324; Edelman, 1992; Crick, 1994; Damasio, 1999), or idealistically, as an ontological singularity being transcendent to the brain's physical structure (McDowell, 1994, pp. 190–205; Chalmers, 1996; Pearce, 2014; Scruton, 2017). Regardless of the accepted interpretation, the definitional problem within the framework of scientific consensus remains unresolvable at present.² Nevertheless, there is practically no doubt that consciousness is gradational (and therefore roughly measurable), i.e., that its individual realizations can be considered as components that together form a kind of spectrum (Edelman & Tononi, 2000; Tononi, 2008; Seth et al., 2008, pp. 314–321; Arrabales et al., 2010, pp. 213–225; Overgaard, 2015). The common definitional point for the description of higher-order consciousness (Gennaro, 2004; Rosenthal & Weisberg, 2008; Lau & Rosenthal, 2011, pp. 365–373)—according to theories postulating the differentiation of consciousness into individual degrees, which, in reference to the categorization of Gerald Edelman (1992; 2003), could generally be described as emanations of (1.) primary or (2.) secondary consciousness (pp. 5520–5524)—can already be found in the thought of John Locke (1975) expressed in *An Essay Concerning Human Understanding*:

Consciousness is the perception of what passes in a man's own mind (II, i, 19).³

Therefore, higher-order consciousness is not only “awareness of the environment” but also “awareness of awareness” (Thomas, 1967, p. 366), although such a specification, based on the definitional recursion and bringing to mind the homunculus fallacy, must raise objections.

¹ Sometimes also quantum (e.g., Beck & Eccles, 1992, pp. 11357–11361; Hameroff & Penrose, 1996, pp. 36–53; Atmanspacher, 2020), especially in the framework of the so-called holonomic theory (Pribram & Carlton, 1986, pp. 175–210; Peruš & Chu Kiong, 2010).

² As Stuart Sutherland (1995) writes, consciousness as a concept is “impossible to define except in terms that are unintelligible without a grasp of what consciousness means. (...) It is impossible to specify what it is, what it does, or why it evolved. Nothing worth reading has been written on it” (p. 95). More restrictive attempts to define consciousness are made within the framework of neuroscience. According to the notion of Bryan G. Young presented in the second edition of the *Encyclopedia of Neurological Sciences* (Aminoff & Daroff, 2014), “consciousness has been variably defined but includes both wakefulness and awareness. Wakefulness is evidenced by the awake state with eyes open and the capacity for arousal from sleep or drowsiness. Awareness consists of the person being aware of, cognizant of, and attending to aspects of one's own self and the environment. It is axiomatic that awareness depends on alertness being present” (p. 858).

³ More about Locke's concept of consciousness and personal identity: Lycan, 1996, pp. 14–17; Lähteenmäki, 2011, pp. 160–178; Lisman, 2017; Gordon-Roth, 2019.

Dasein

Introduced by Martin Heidegger (1967; 2001), the philosopheme *Dasein* (lit. “being-there” or “there-being”—Childers & Hentzi, 1995, p. 70) is most extensively discussed in his dissertation *Sein und Zeit (Being and Time)* published in 1927. *Dasein* appears as a being [*Sein*], „a pure expression of its being [*als reiner Seinsausdruck*]” (S. 12; p. 33),⁴ having an understanding of being [*Verstehens von Sein*] (S. 12; p. 32) as well as, “among other things, (...) the ability to ask questions [*die Seinsmöglichkeit des Fragens*]” (S. 7; p. 27)—thus remaining in some kind of conscious *relation to* [*Beziehung*] (or *relationship with* [*Verhältnis*]) others’ and its own being(s). „In its (*Dasein*’s—F. Ś.) very being, that being is an *issue* for it [*diesem Seienden in seinem Sein »um« dieses Sein selbst geht*]” (S. 12; p. 32). Its way of being, i.e., its *essence* [*Wesen*], is its *existence* [*Existenz*]—and “all existing is already a philosophizing [*alles Existieren ist schon ein Philosophieren*]” (1978, S. 274; 1992, p. 212). *Dasein* „is such a being, which each of us is himself [*dieses Seiende, das wir selbst je sind*]” (1967, S. 7; 2001, p. 27), though it is not a man (S. 45; pp. 70–71)—it rather exists “in” a man, appearing as his essence. It constitutes the actual *potentiality of (conscious) being* [*Sein-können*] “in” the world (or potentiality of *being-in-the-world* [*Sein-können-in-der-Welt*] (SS. 53–62; pp. 78–90)) and “in relation to” the world, internal potentiality of actual existence—hence “*Dasein*, as existing, is always, in essence, necessarily ‘further’ than any given factual being [*als existierendes wesensnotwendig immer »weiter« als jegliches faktische Seiende*]” (1978, S. 279; 1992, p. 215). *Dasein* itself does not have the characteristics of a haecceity, but it may manifest in and pass through the entity which has such the characteristics, appearing in parallel with the questions of the entity about being [*Sein*] and about its self [*Selbst*] (1967, SS. 114–115; 2001, pp. 150–151). Their results are supposed to be the self-understanding and the self-recognition—again—“in” and “in relation to” the world, entity’s *being-in-the-world* [*In-der-Welt-sein*] (S. 146; p. 186), and therefore—conscious *individualization* [*Vereinzelung*] (SS. 184–191; pp. 228–235) as well as individual consciousness.

Difficulties in defining the term *Dasein* result primarily from the inconsistency of Heidegger’s own approach (Jaran, 2010; Sobota, 2011, pp. 255–271; Zuckerman, 2015, pp. 493–516). Nevertheless, to concretize, it can be assumed that *Dasein* is either (1.) a being with such a class of potentials that allows it a reasonable, analytical, and individualized (i.e., possessing qualia (Lycan, 1996, pp. 69–142; Dennett, 2017, pp. 5–12; Tye, 2021) or, if they do not exist (Dennett, 1988, pp. 42–77; 1991), having the impression of the possession of them) reception of the surrounding world and itself as individual (separate) consciousness (i.e., as a phenomenon), which is achieved, inter alia, by asking questions (the space in which they are formed is the language) directed both onward and inward, or (2.) such a class of potentials itself. Thus formulated, the category of *Dasein* definitionally remains in agreement with the category of higher-order consciousness, both of which, for obvious reasons, must accept anthropocentric optics axiomatically (Nagel, 1974, pp. 435–450; Hacker, 2002, pp. 157–174).

Detection of *Dasein*—higher-order consciousness and the anthropocentric problem

The acceptance of anthropocentric optics in discourse is inevitable in the sense that when we speak of higher-order consciousness, we are forced to think of consciousness similar to ours. Considering the question, “Is some kind of a being the realization of *Dasein*, can it be

⁴ Here and hereafter, I usually propose my own translation of the *Sein und Zeit* excerpts; in the beginning, I include a reference to the original (Heidegger, 1967), then *pro forma* to the English edition (Heidegger, 2001).

perceivable as having higher-order consciousness?” we are, in fact, asking whether it is conscious like a man and whether it thinks like a man, although both of these categories seem unclear. With this in mind, Alan Turing, studying the problem of intelligence of non-human beings (i.e., machines), has proposed in *Computing Machinery and Intelligence* (1950) the Imitation Game, according to which a program considered to be intelligent should be perfectly mimetic and indistinguishable from a human (p. 433–460). The irrevocable implication of this approach is the problem of a hypothetical philosophical zombie (Kirk, 2005, 2019), potentially unsolvable—if the distinguishing mark for the recognition of being as the realization of *Dasein* is to be the fullness of imitative linguistic abilities, then, according to Douglas Hofstadter and Daniel Dennett (1981, pp. 92–95), such a being should be recognized as having higher-order consciousness; if the distinguishing mark is to be qualia, by nature inexpressible in words, we fall down the rabbit hole of the problem of other minds and solipsism, since neither a being realizing the category of *Dasein*, nor a being imitating its realization, will be able to reliably communicate them, although they can assure about them.

Proposed by Victor Argonov (2011, p. 59; 2014, pp. 51–70), the test based on the detection of phenomenal judgments could be considered as hypothetically promising and complementary to the Imitation Game. According to his approach, a being (machine) can be regarded as conscious (and consciousness can be regarded as deterministic) when it is able to “produce phenomenal judgments on all problematic properties of consciousness”⁵ even though it does not have any “innate (preloaded) philosophical knowledge,” has not had any “philosophical discussions while learning,” and “does not contain informational models of other creatures” (p. 60). However, this type of test raises a number of questions, i.e., (1.) what kind of discussions qualifies as the philosophical discussions⁶ and (2.) is it possible for other beings considered to be conscious (i.e., humans) to completely avoid them during the learning process, and if so, then (3.) can they—despite absence of such discussions—be (or: be considered as) actually conscious?⁷

In general, proceeding from the axiom of anthropocentric optics, one should recognize that a perfectly imitative being (program) simulating or pretending to be human intelligence, exhibiting (or undetectably mimicking) perfectly “human” qualities (i.e., assurances about the possession of consciousness and about recognizing it in other beings, possible assurances about the occurrence of (hypothetical) qualia, certain spontaneity of thought, the ability to produce phenomenal judgments, etc.) should be considered conscious—not as philosophical zombies. Otherwise, as already mentioned, we fall down the rabbit hole of the problem of other minds and solipsism, and (in their framework) a dilemma that I would call the problem of bilateral imputing (or bilateral attribution): *If I attribute consciousness to myself and others, and others attribute consciousness to me and themselves, do we have consciousness?*—or more precisely—if in a finite set of (perfectly imitative) beings, each of the beings attributes consciousness to itself and to the other beings, can it be considered that all the beings have consciousness? Ultimately, regardless of whether we consider the study of

⁵ Though he later adds: “Problematic terms such as ‘consciousness’ should be avoided. Maybe it would be better to start the test with the discussion about qualia and religious questions” (p. 60).

⁶ Finally, to echo Heidegger’s thought once more, “all existing is already a philosophizing” (1992, p. 212).

⁷ One of the brightest examples here may be feral children. William Foulkes (1990, pp. 39–55; 1999), referring to the categorization of William Lycan (1996, pp. 1–44), mentions that children raised in normative conditions (i.e., not isolated from human society) acquire “introspective consciousness” (which, according to the proposed reception of Heidegger’s *Dasein*, should be considered as its integral component) between the fifth and seventh years of life (the fifth and sixth according to Katherine Nelson and Robyn Fivush (2020, 71–96)). Feral children are deprived of it at least until they take appropriate socialization, including language learning (Williams, 1983; McNeil et al., 1984, pp. 70–79; Dombrowski et al., 2011, pp. 81–93).

beings realizing either authentic or simulated (phantom) *Dasein*, the fundamental, main space and channel of such research is always (spoken or not) language. In other words: it is impossible to deliberate about a being having higher-order consciousness (in an anthropocentric sense) without the use of language.

The question as a central category

The appropriateness of the Heideggerian term *Dasein* in describing higher-order consciousness lies, i.a., in the fact that it emphasizes the ability to ask questions as its integral component and prerequisite. Asking questions is a central category, available only to humans among biological beings known to us, which is confirmed by primatological research (e.g., Terrace et al., 1979, pp. 891–902; Patterson, 1981, pp. 86–87; Gardner et al., 1989; Savage-Rumbaugh & Lewin, 1994; Fouts & Fouts, 1996; Hillix & Rumbaugh, 2004; Terrace, 2019)—none of the primates, which until now have been taught to communicate with humans using tools characteristic of language, was able to formulate questions (not to mention formulating them spontaneously), although they could “understand” them and/or try to respond adequately to them (Premack, 1976; Premack & Premack, 1983; Jordania, 2006). It seems that the inability of primates to master this skill and, in general, to develop linguistic abilities is not due to the limitations in their vocal tract anatomy (Fitch et al., 2016) but to the genetic limitations associated with, i.a., their coding of FOXP2 and SRPX2 proteins (Enard et al., 2002, pp. 869–872; Zhang et al., 2002, pp. 1825–1835; Scharff & Petri, 2011, pp. 2124–2140), as well as to the neurological limitations, resulting from differences in the cerebral cortex development (Mora-Bermúdez et al., 2016) and in the architecture of the homologs of Broca’s (Schenker et al., 2010, pp. 730–742) and Wernicke’s areas (Spocter et al., 2010, pp. 2165–2174). Even though it is presumed that some primates, such as *Pan paniscus* or *Pan troglodytes*, are able to pass the mirror self-recognition (MSR) test (Gallup, 1970, pp. 86–87; Calhoun & Thompson, 1988, pp. 361–365; Bekoff, 2002, p. 255; Bekoff et al., 2002), due to the lack of evolutionary predestination they are not and will not be able to go beyond the realm of para-consciousness—no matter how far-reaching attempts would be made to teach them to understand the language. Programmable machines seem to be much more promising in both of these areas (Hodson, 2012, p. 23; Hoffmann et al., 2021, pp. 37–51).

Considering language and the ability to ask questions as two inalienable pillars of *Dasein*, one can presume that the evolutionary development of linguistic abilities and secondary consciousness ran in parallel, bringing with it the emergence of symbolic (and successively proto-religious) behaviors. Archeological reconstruction and research on endocasts (Beaudet, 2017), combined with molecular analysis and research on artifacts, as well as on, in general, culture-forming traces (Tobias, 1998, pp. 72–78), suggest that perhaps *Homo erectus* may have used some form of proto-language (Newmeyer, 2003, pp. 58–76; Hillert, 2015), while *Homo neanderthalensis* was using it almost certainly (La May, 1975, pp. 9–14; Kuckenburger, 1997; Kochiyama et al., 2018; Balzeau & Pagano, 2021, 1–8)—hence, it can be assumed that the first manifestations of higher-order consciousness among hominids occurred between 2–0.4 Ma BP.

Conclusion

Consciousness as a phenomenon can be understood in at least two ways; regardless of the adopted definitional framework, it remains gradational. Attempts at a descriptive approach and researching it (in particular higher-order consciousness) are, due to human cognitive limitations, irrevocably forced to adopt anthropocentric optics. Similarly, attempts to detect it

(especially among artificial beings) are (and will remain) problematic. However, there is undoubtedly a close relationship between the evolutionary development of linguistic abilities and the development of secondary consciousness—therefore, it can be assumed that its first manifestations among hominids appeared at least 400,000 years ago. Such language skills must include, as Heidegger aptly suggested, the ability to ask questions, since a question is a lever of higher-order consciousness. The consideration of language as an irrevocable component of consciousness should find its application, *inter alia*, in research on the development of artificial general intelligence (AGI). The role of spontaneous (spontaneously generated) internal monologues (as well as “streams of thoughts” (Christoff et al., 2016, pp. 718–731; Zanesco, 2020, pp. 2417–2437) understood as streams of nonrandom words) in the formation of higher-order consciousness seems to be a complementary problem worth considering—what, however, goes beyond the actual subject matter of this paper.

References

- Aminoff, M. J., & Daroff, R. B. (Eds.). (2014). *Encyclopedia of Neurological Sciences* (2nd ed., vol. 1). London–Waltham–San Diego: Academic Press.
- Argonov, V. Yu. (2011). Is a Machine Able to Speak About Consciousness? Rigorous Approach to Mind–Body Problem and Strong AI. In S. Hameroff (Ed.), *Towards a Science of Consciousness* (p. 59). Tucson: Center of Consciousness Studies.
- Argonov, V. Yu. (2014). Experimental Methods for Unraveling the Mind–Body Problem: The Phenomenal Judgment Approach. *The Journal of Mind and Behavior*, 35(1–2), 51–70.
- Arrabales, R., Ledezma, A., & Sanchis, A. (2010). The Cognitive Development of Machine Consciousness Implementations. *International Journal of Machine Consciousness*, 2(2), 213–225. DOI: 10.1142/S179384301000045X
- Atmanspacher, H. (2020). Quantum Approaches to Consciousness. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*.
<https://plato.stanford.edu/archives/sum2020/entries/qt-consciousness/>
- Balzeau, A., & Pagano, A. (2021). The Cranial Base and Related Internal Anatomical Features in *Homo neanderthalensis* and *Homo sapiens*. *The Anatomical Record*, 1–8. DOI: 10.1002/ar.24854
- Beaudet, A. (2017). The Emergence of Language in the Hominin Lineage: Perspectives from Fossil Endocasts. *Frontiers in Human Neuroscience*, 11, 427. DOI: 10.3389/fnhum.2017.00-427
- Beck, F., & Eccles, J. (1992). Quantum Aspects of Brain Activity and the Role of Consciousness. *PNAS*, 89(23), 11357–11361. DOI: 10.2307/2360706
- Bekoff, M. (2002). Awareness: Animal Reflections. *Nature*, 419(6904), 255. DOI: 10.1038/41-9255a
- Bekoff, M., Allen, C., & Burghardt, G. M. (Eds.). (2002). *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition*. Cambridge–London: MIT Press.
- Calhoun, S., & Thompson, R. L. (1988). Long-Term Retention of Self-Recognition by Chimpanzees. *American Journal of Primatology*, 15(4), 361–365. DOI: 10.1002/ajp.135015-0409
- Chalmers, D. J. (1996). *The Conscious Mind: In Search of a Fundamental Theory*. New York–Oxford: Oxford UP.
- Childers, J., & Hentzi, G. (Eds.). (1995). *The Columbia Dictionary of Modern Literary and Cultural Criticism*. New York: Columbia UP.

- Christoff, K., Irving, Z. C., Fox, K. C. R., Spreng, N. R., & Andrews-Hanna, J. R. (2016). Mind-Wandering as Spontaneous Thought: A Dynamic Framework. *Nature Reviews Neuroscience*, *17*, 718–731. DOI: 10.1038/nrn.2016.113
- Crick, F. (1994). *The Astonishing Hypothesis: The Scientific Search for the Soul*. New York: Charles Scribner's Sons.
- Damasio, A. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. San Diego–New York–London: Harcourt Brace and Co.
- Dennett, D. (1988). Quining Qualia. In A. J. Marcel & E. Bisiach (Eds.), *Consciousness in Contemporary Science* (pp. 42–77). New York–Oxford: Oxford UP.
- Dennett, D. (1991). *Consciousness Explained*. Boston: Little Brown.
- Dennett, D. (2017). A History of Qualia. *Topoi*, *39*(1), 5–12.
- Dombrowski, S. C., Gischlar, K. L., Mrazik, M., & Greer, F. W. (2011) Feral Children. In S. C. Dombrowski, K. L. Gischlar, & M. Mrazik (Eds.), *Assessing and Treating Low Incidence/High Severity Psychological Disorders of Childhood* (pp. 81–93). New York: Springer.
- Eccles, J. (1992). Evolution of Consciousness. *PNAS*, *89*(16), 7320–7324. DOI: 10.1073/pnas.89.16.7320
- Edelman, G. M. (1992). *Bright Air, Brilliant Fire: On the Matter of the Mind*. New York: Basic Books.
- Edelman, G. M. (2003). Naturalizing Consciousness: A Theoretical Framework. *PNAS*, *100*(9), 5520–5524. DOI: 10.1073/pnas.0931349100
- Edelman, G. M., & Tononi, G. (2000). *A Universe of Consciousness: How Matter Becomes Imagination*. New York: Basic Books.
- Enard, W., Przeworski, M., Fisher, S. E., Lai, C. S. L., Wiebe, V., Kitano, T., Monaco, A. P., & Pääbo, S. (2002). Molecular Evolution of FOXP2, a Gene Involved in Speech and Language. *Nature*, *418*(6900), 869–872. DOI: 10.1038/nature01025
- Fitch, W. T., de Boer, B., Mathur, N., & Ghazanfar, A. A. (2016). Monkey Vocal Tracts Are Speech-Ready. *Science Advances*, *2*(12), e1600723. DOI: 10.1126/sciadv.1600723
- Foulkes, D. (1990). Dreaming and Consciousness. *European Journal of Cognitive Psychology*, *1*(2), 39–55.
- Foulkes, D. (1999). *Children's Dreaming and the Development of Consciousness*. Cambridge, Harvard UP.
- Fouts, R. S., & Fouts, D. H. (1996). Chimpanzees' Use of Sign Language. In P. Cavalieri & P. Singer (Eds.), *The Great Ape Project. Equality Beyond Humanity* (pp. 28–41). New York: St. Martin's Press.

- Gallup, G. G. Jr. (1970). Chimpanzees: Self-Recognition. *Science*, 167(3914), 86–87. DOI: 10.1126/science.167.3914.86
- Gardner, R. A., Gardner, B. T., & Van Cantfort, T. E. (Eds.) (1989). *Teaching Sign Language to Chimpanzees*. New York: SUNY Press.
- Gennaro, R. J. (Ed.). (2004). *Higher-Order Theories of Consciousness: An Anthology*. Amsterdam–Philadelphia: John Benjamins Publishing Company.
- Gordon-Roth, J. (2019). Locke on Personal Identity. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. <https://plato.stanford.edu/entries/locke-personal-identity/>
- Hacker, P. M. S. (2002). Is There Anything It Is Like to Be a Bat? *Philosophy*, 77(2), 157–174. DOI: 10.1017/s0031819102000220
- Haeckel, E. (1868). *Natürliche Schöpfungsgeschichte*. Berlin: Reimer.
- Haeckel, E. (1880). *The History of Creation* (Vol. II) (E. R. Lankester, Transl.). New York: D. Appleton and Company, 302.
- Hameroff, S. R., & Penrose, R. (1996). Conscious Events as Orchestrated Spacetime Selections. *Journal of Consciousness Studies*, 3(1), 36–53.
- Heidegger, M. (1967). *Sein und Zeit* (11th ed). Tübingen: Max Niemeyer Verlag. (Original work published 1927)
- Heidegger, M. (1978). *Metaphysische Anfangsgründe der Logik im Ausgang von Leibniz*. Frankfurt am Main: Vittorio Klostermann Verlag. (Original work published 1928)
- Heidegger, M. (1992). *The Metaphysical Foundations of Logic*. (M. Heim, Trans.). Bloomington–Indianapolis: Indiana UP.
- Heidegger, M. (2001). *Being and Time* (J. Macquarrie & E. Robinson, Trans.). Oxford–Cambridge: Blackwell Publishers Ltd. (Original work published 1927)
- Hillert, D. G. (2015). On the Evolving Biology of Language. *Frontiers in Psychology*, 6, 1796. DOI: 10.3389/fpsyg.2015.01796
- Hillix, W. A., & Rumbaugh, D. (2004). *Animal Bodies, Human Minds: Ape, Dolphin, and Parrot Language Skills*. New York: Springer.
- Hodson, H. (2012). Robot Learns to Recognise Itself in the Mirror. *New Scientist*, 215(2878), 23. DOI: 10.1016/s0262-4079(12)62120-4
- Hoffmann, M., Wang, S., Outrata, V., Alzueta, E., & Lanillos, P. (2021). Robot in the Mirror: Toward an Embodied Computational Model of Mirror Self-Recognition. *Künstliche Intelligenz*, 35, 37–51. DOI: 10.1007/s13218-020-00701-7

- Hofstadter, D. R., & Dennett, D. (1981). *The Mind's I: Fantasies and Reflections on Self and Soul*. Toronto–New York–London–Sydney–Auckland: Bantam Books.
- Jaran, F. (2010). *La Métaphysique du Dasein. Heidegger et la possibilité de la métaphysique (1927–1930)*. Bucarest: Zeta Books.
- Jibu, M., & Yasue, K. (1997). What Is Mind? Quantum Field Theory of Evanescent Photons in Brain as Quantum Theory of Consciousness. *Informatica*, 21(3), 471–490.
- Jordania, J. (2006). *Who Asked the First Question? The Origins of Human Choral Singing, Intelligence, Language and Speech*. Tbilisi: Logos.
- Kirk, R. (2005). *Zombies and Consciousness*. New York–Oxford: Oxford UP.
- Kirk, R. (2019). Zombies. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. <https://seop.illc.uva.nl/entries/zombies/>
- Kochiyama, T., Ogiwara, N., Tanabe, H. C., Kondo, O., Amano, H., Hasegawa, K., Suzuki, H., Ponce de León, M. S., Zollikofer, Ch. P. E., Bastir, M., Stringer, Ch., Sadato, N., & Akazawa, T. (2018). Reconstructing the Neanderthal Brain Using Computational Anatomy. *Scientific Reports*, 8, 6296. DOI: 10.1038/s41598-018-24331-0
- Kuckenbunrg, M. (1997). *Lag Eden im Neandertal? Auf der Suche nach den frühen Menschen*. Duesseldorf: Econ.
- La May, M. (1975). The Language Capability of Neanderthal Man. *American Journal of Physical Anthropology*, 42, 9–14. DOI: 10.1002/ajpa.1330420103
- Lähteenmäki, V. (2011). Locke on Consciousness and What it is About. *Studia Leibnitiana*, 43(2), 160–178.
- Lau, H., & Rosenthal, D. (2011). Empirical Support for Higher-Order Theories of Conscious Awareness. *Trends in Cognitive Sciences*, 15(8), 365–373. DOI: 10.1016/j.tics.2011.05.009
- Lisman, J. E. (2017). Locke's View of the Hard Problem of Consciousness and Its Implications for Neuroscience and Computer Science. *Frontiers in Psychology*, 8, 1069. DOI: 10.3389/fpsyg.2017.01069
- Locke, J. (1975). *An Essay Concerning Human Understanding* (P. H. Nidditch, Ed.). New York–Oxford: Oxford UP. (Original work published 1689)
- Lycan, W. G. (1996). *Consciousness and Experience*. Cambridge–London: MIT Press.
- McDowell, J. (1994). The Content of Perceptual Experience. *The Philosophical Quarterly*, 175(44), 190–205. DOI: 10.2307/2219740
- McNeil, M. C., Polloway, E. A., & Smith, J. D. (1984). Feral and Isolated Children: Historical Review and Analysis. *Education and Training of the Mentally Retarded*, 19, 70–79.

- Mora-Bermúdez, F., Badsha, F., Kanton, S., Camp, G., Vernot, B., Köhler, K., Voigt, B., Okita, K., Maricic, T., He, Z., Lachmann, R., Pääbo, S., Treutlein, B., & Huttner, W. B. (2016). Differences and Similarities Between Human and Chimpanzee Neural Progenitors During Cerebral Cortex Development. *eLife*, 5, e18683. DOI: 10.7554/eLife.18683
- Nagel, T. (1974). What Is It Like to Be a Bat? *The Philosophical Review*, 83(4), 435–450. DOI: 10.2307/2183914
- Nelson, K., & Fivush, R. (2020). The Development of Autobiographical Memory, Autobiographical Narratives, and Autobiographical Consciousness. *Psychological Reports*, 1(123), 71–96. DOI: 10.1177/0033294119852574
- Newmeyer, F. J. (2003). What Can the Field of Linguistics Tell Us About the Origins of Language? In M. H. Christiansen & S. Kirby (Eds.), *Language Evolution* (pp. 58–76). New York–Oxford: Oxford UP.
- Overgaard, M. (Ed.) (2015). *Behavioral Methods in Consciousness Research*. New York–Oxford: Oxford UP.
- Patterson, F. G. (1981). Ape Language. *Science*, 211(4477), 86–87. DOI: 10.1126/science.-211.4477.86-a
- Pearce, D. (2014). *Non-Materialist Physicalism. An Experimentally Testable Conjecture*. BLTC Research. <https://www.hedweb.com/physicalism/>
- Peruš, M., & Chu Kiong, L. (2010). *Biological and Quantum Computing for Human Vision: Holonomic Models and Applications*. New York: IGI Global.
- Premack, D. (1976). *Intelligence in Ape and Man*. London: Psychology Press.
- Premack, D., & Premack, A. J. (1983). *The Mind of an Ape*. New York–London: W. W. Norton & Company.
- Pribram, K. H., & Carlton, E. H. (1986). Holonomic Brain Theory in Imaging and Object Perception. *Acta Psychologica*, 63(2), 175–210. DOI: 10.1016/0001-6918(86)90062-4
- Rosenthal, D., & Weisberg, J. (2008). Higher-Order Theories of Consciousness. *Scholarpedia*, 5(3), 4407. DOI: 10.4249/scholarpedia.4407
- Savage-Rumbaugh, S., & Lewin, R. (1994). *Kanzi: The Ape at the Brink of the Human Mind*. New York–Chichester–Brisbane–Toronto–Singapore: John Wiley & Sons.
- Scharff, C., & Petri, J. (2011). Evo-Devo, Deep Homology and FOXP2: Implications for the Evolution of Speech and Language. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 366(1574), 2124–2140. DOI: 10.1098/rstb.2011.0001

- Schenker, N. M., Hopkins, W. D., Spocter, M. A., Garrison, A. R., Stimpson, C. D., Erwin, J. M., Hof, P. R., & Sherwood, C. C. (2010). Broca's Area Homologue in Chimpanzees (*Pan troglodytes*): Probabilistic Mapping, Asymmetry, and Comparison to Humans. *Cerebral Cortex*, 20(3), 730–742. DOI: 10.1093/cercor/bhp138
- Scruton, R. (2017). *On Human Nature*. Princeton–Oxford: Princeton UP.
- Seth, A. K., Dienes, Z., Cleeremans, A., Overgaard, M., & Pessoa, L. (2008). Measuring Consciousness. Relating Behavioural and Neurophysiological Approaches. *Trends in Cognitive Science*, 12(8), 314–321. DOI: 10.1016/j.tics.2008.04.008
- Sobota, D. (2011). Kim jest *Dasein*? *Przegląd Filozoficzny. Nowa Seria*, 79(3), 255–271.
- Spocter, M. A., Hopkins, W. D., Garrison, A. R., Bauernfeind, A. L., Stimpson, C. D., Hof, P. R., & Sherwood, C. C. (2010). Wernicke's Area Homologue in Chimpanzees (*Pan troglodytes*) and Its Relation to the Appearance of Modern Human Language. *Proceedings of the Royal Society B: Biological Sciences*, 277(1691), 2165–2174. DOI: 10.1098/rspb.2010.0011
- Sutherland, S. (1995). *The Macmillan Dictionary of Psychology*. London: The Macmillan Press Ltd.
- Terrace, H. S. (2019). *Why Chimpanzees Can't Learn Language and Only Humans Can*. Columbia: Columbia UP.
- Terrace, H., Petitto, L. A., Sanders, R. J., & Bever, T. G. (1979). Can an Ape Create a Sentence? *Science*, 206(4421), 891–902. DOI: 10.1126/science.504995
- Thomas, G. J. (1967). Consciousness. In J. L. Garvin, F. H. Hooper, & W. Yust (Eds.), *Encyclopædia Britannica* (14th ed., vol. 6, p. 366). London–New York: Encyclopædia Britannica, Inc.
- Tobias, P. V. (1998). Evidence for the Early Beginnings of Spoken Language. *Cambridge Archaeological Journal*, 8, 72–78.
- Tononi, G. (2008). Consciousness as Integrated Information: A Provisional Manifesto. *The Biological Bulletin*, 215(3), 216–242. DOI: 10.2307/25470707
- Turing, A. (1950). Computing Machinery and Intelligence. *Mind*, 236(59), 433–460.
- Tye, M. (2021). Qualia. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. <https://seop.illc.uva.nl/entries/qualia/>
- Williams, T. R. (1983). *Socialization*. Englewood Cliffs: Prentice-Hall.
- ZanESCO, A. P. (2020). Quantifying Streams of Thought During Cognitive Task Performance Using Sequence Analysis. *Behavior Research Methods*, 52, 2417–2437. DOI: 10.3758/s13428-020-01416-1

Zhang, J., Webb, D. M., & Podlaha, O. (2002). Accelerated Protein Evolution and Origins of Human-Specific Features: FOXP2 as an Example. *Genetics*, 162(4), 1825–1835. DOI: 10.1093/genetics/162.4.1825

Zuckerman, N. (2015). Heidegger and the Essence of *Dasein*. *The Southern Journal of Philosophy*, 53(4), 493–516. DOI: 10.1111/sjp.12151

Contact email: f.w.swierczynski@gmail.com