

A Neurologist's Take on the History and Philosophy of Science: Epistemic Inconsistencies and Biological Essentialism in Norman Geschwind's Research on Brain Laterality

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In a series of three publications from 1985, U.S. neurologist Norman Geschwind and his colleagues proposed that brain asymmetry and a vast array of human 'abnormalities' might have a shared cause. According to the theory, prenatal testosterone exposure regulates fetal brain development, and excessive levels of the hormone can lead to left-handedness, pigmentation anomalies, hair loss, immune disorders, migraine, scoliosis, dyslexia, stuttering, epilepsy, autism, homosexuality, and various other 'abnormal' physical, mental, and behavioral characteristics. Geschwind produced virtually no experimental data to back his hypothesis. Proficient in eight languages, he based his model on a review of hundreds of publications from disciplines ranging from anatomy to zoology, dating from every decade since the 1860s.

Based on archival collections and oral history interviews, this paper demonstrates how Geschwind's interest in the history and philosophy of science inspired him to combine old and new knowledges. In doing so, Geschwind attempted to resurrect allegedly suppressed knowledge from the past and feed it back into the medico-scientific discourse to generate a grand unified theory of the human body and character.

Geschwind referred to his integrative model as "naive speculations," but this did not shield him from severe critique.¹ In the late 1970s and early 1980s, Geschwind and his colleagues presented aspects of their model to the medical and neuroscientific community with questionable success. Geschwind also published articles and presented papers on the history of neurology. In his communication and personal notes, he made explicit his Popperian understanding of falsification and his firm belief in the teleological trajectory of science. Concretely, he favored highly reductionist theories, because he assumed that they can be proven wrong very quickly, which purportedly allows for rapid scientific progress. Faced with increasing opposition to his model of testosterone-induced brain lateralization, Geschwind slowly retreated from the scientific community. In 1984, before the hypothesis was published in full, he passed away at the age of 58.

I suggest that Geschwind's wish to revive older research paradigms in a reductionist fashion was grounded in his commitment to 'objectivity' and the growth of knowledge, but that it undermined his personal commitment to equality and respect for the individual. In his personal and professional life, for instance, Geschwind supported women and minorities. Moreover, he embraced German scholarship, although he was Jewish and had been stationed in Germany during World War II. As a proponent of 'objectivity', Geschwind read scientific literature through a presentist lens and stripped the data of contextual information. To name a few examples, he ignored the subtext of colonialism and the fear of degeneration in late-19th-century anatomy, the eugenicist foundations of genetic theories of laterality, and the gender-stereotypical connotations of endocrinological research. In doing so, Geschwind distilled both forgotten and well-known research into a theory that essentialized sex/gender, sexual orientation, dis/ability, class, and race/ethnicity.

¹ N. Geschwind and A. M. Galaburda, "Cerebral Lateralization—Biological Mechanisms, Associations, and Pathology III: A Hypothesis and a Program for Research," *Archives of Neurology* 42, no. 7 (1985): 652.

Geschwind's habit of taking scientific literature at face value also caused epistemic in-consistencies in his model. By drawing on texts from a wide range of times, places, and disciplines, Geschwind mobilized incoherent concepts of 'the brain'. The epistemic objects in Geschwind's sources include anatomical, electrical, hormonal, and genetic brains. Each of these epistemic versions of 'the brain' has been assessed with a variety of methods, ranging from questionnaires to behavioral observation, and from brain imaging to lesion studies. In his attempt to synthesize more than a century of research on brain laterality, Geschwind glossed over these substantial differences. Most notably, this led to a tension between concepts of fixity and plasticity in Geschwind's model.

This case study illuminates a neurologists' questionable appropriation of the history and philosophy of science in order to speed up the 'evolution of knowledge'. Helge Kragh cautioned scientists years ago not to write the history of their own fields unless they have "learn[ed] the necessary historiographical skills."² Geschwind never underwent such training. Guided by an interest in the history of science, Geschwind appropriated past science in an attempt to resurrect suppressed knowledge and integrate all available literature into his theory. I posit that this move may have increased the epistemic incoherence of his hypothesis. Furthermore, his philo-sophical convictions (that is, his commitment to falsification, reductionism, and the rapid growth of knowledge) might have encouraged Geschwind to put forth a theory that essentialized 'the other' in U.S. neurology during the Cold War. I conclude with a consideration of the question: How can the history and philosophy of science prevent being appropriated to pro-mote simplistic scientific understandings of the 'evolution of knowledge'?

² H. Kragh, "Problems and Challenges in the Historical Study of the Neurosciences," *Journal of the History of the Neuro-sciences* 11, no. 1 (2002): 61.