

Roger Sperry (1913–1994): Split-brain Research

The first experiments into split-brains with humans were conducted in the 1930s in an effort to alleviate severe epilepsy (Sperry, 1975). The assumption was that the corpus callosum, connecting the hemispheres was producing the brain waves that were the source of the seizures. The most outstanding finding was an apparent lack of impact on the behavior of the individual or to personality (recall that the personality of Phineas Gage had resulted in major changes to personality). Subsequent research failed to reveal any psychological deficits following surgery. This inspired Sperry and his colleagues to sever the corpus callosum of monkeys and cats. It was found that the disconnected halves of the brain had their own independent sensations, perceptions and learned separately, and without the other half having any awareness. Each hemisphere also housed its own independent memories. When one hemisphere learned something in a task it did not transfer to the other. It would have to be relearned for the other hemisphere to benefit from the experience. Each hemisphere could even be taught solutions that were completely contradictory and without any apparent conflict, as though each hemisphere had its own mind.

The findings did not really speak to humans since their left and right brains are specialized for functions like speech that other mammals do not possess. It was not until 1961 that an opportunity arose to examine the effects of brain-splitting surgery on humans. The patient had suffered brain damage during the Second World War and suffered severe convulsions. The seizures were alleviated and the person appeared, on the surface, quite normal in terms of everyday behavior. Specialized testing revealed that each hemisphere had its own particular type of intellect. The left is verbal and mathematical, logical and analytic. The right is mute and spatial.

Michael Gazziniga, Roger Sperry, and Joseph Bogen conducted studies in split-brain testing from 1962–1967 and initiated the modern period of split-brain research during the 1970s (Gazziniga, 2005). Doing pre-operational and post-operational testing, Gazziniga was impressed by the discovery that a patient named W. J. was no longer capable of describing verbally stimuli that were presented to the right hemisphere alone. Thinking in the hemispheres was either verbal or nonverbal (Sperry, 1973). This, to Sperry, pointed out a serious weakness of the educational system since it discriminates against the functioning of the right hemisphere in its emphasis on linguistic capabilities.

While casual investigation suggests no ill effects of the severing procedure, experiments that carefully controlled the information going to each hemisphere indicated that there were differences. An apparatus was created that involved a screen whose center was fixated upon (Weiskrantz, 1997). A word like “key” is projected through the left eye to the non-linguistic right hemisphere and another “ring” is projected to the left, linguistic hemisphere. Afterwards the person was asked to indicate what word was projected and could report verbally “ring” but was silent regarding the presentation of “key” and denied a word was present. When asked, however, to select an object, the left hand, under the control of the right hemisphere, correctly selects a key. This is depicted visually at the following web site and further discussion is available: www.collegeofteachers.ac.uk/content/does-education-tap-only-half-our-brain-power-unravelling-concerns-about-standards-professor-

See Sperry (1973) for an overview at:

<http://people.uncw.edu/puente/sperry/sperrypapers/70s/173-1973.pdf>

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