

This Week's Citation Classic®

Galin D. Implications for psychiatry of left and right cerebral specialization. *Arch. Gen. Psychiat.* 31:572-83, 1974.
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The cognitive specialization of the hemispheres and the symptoms that follow their disconnection are reviewed. The hypothesis is proposed that in normal intact people, mental events in the right hemisphere can become disconnected functionally from the left hemisphere (by inhibition of neuronal transmission across the cerebral commissures) and can continue with a life of their own. This hypothesis suggests a neurophysiological mechanism for at least some instances of repression and an anatomical locus for the unconscious mental contents. A variety of opportunities for research were discussed. [The *SCI*® and the *SSCI*® indicate that this paper has been cited in more than 300 publications.]

Getting Yourself Together; Hemispheric Autonomy and/or Integration

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Why has interest in lateral specialization grown so enormously? It followed on the studies of commissurotomy (split-brain) patients by Roger Sperry and his colleagues, beginning in the 1960s. Literally hundreds of studies have been published, but we can abstract from them two fundamental observations: first, that the two hemispheres in humans are specialized for different cognitive functions; and second, that when they are surgically separated, each hemisphere is capable of sustaining an independent, autonomous consciousness—two minds in one head. I believe it is the latter fact that has captured the interest and imagination of scientists and the public, because it echoes the themes of duality in human nature, of inner conflict, of man divided against himself.

The main reason my paper has been so successful is that I proposed that the split brain was not just another metaphor; there is something deeper, something literal for us here.

Nevertheless, despite fascination with mental duality in the split brain, the vast bulk of research has focused on the specialization, not the duality. Investigators have sought to characterize the specializations, to test which hemisphere can do this or that task best, to seek differences in the amount of specialization in various groups (sex, handedness, vocations, personalities), etc. Only a few focused on

the duality and the potential for hemispheric autonomy and interaction. J.E. Bogen, one of the neurosurgeons who operated on these patients, has consistently and eloquently recalled attention to these aspects for more than two decades¹ and has most influenced my thinking along these lines.

Another reason that this paper had a wide impact was that I was not simply neurologizing psychiatric concepts; rather, I was developing a larger framework for integrating the physiological and psychological. Therefore it could appeal to a wide audience from both disciplines and their near neighbors. Within this structure we could consider phenomena not usually brought together: dissociative experience, electroshock treatment, somatic expression of unconscious ideas, coping strategies and affective reactions, and primary process thinking. This theoretical paper was followed up with several empirical studies.²⁻⁴

There has been notable progress in three areas recently that could support theoretical extension and further empirical grounding of my earlier work. First, the development of magnetic resonance imaging (MRI) has made it possible to get in vivo anatomical measurements of the corpus callosum for correlation with behavioral and experiential variables. Second, sophistication in EEGs and ERPs, and the development of metabolism imaging such as PET, makes it possible to measure the degree of participation of both cortical and subcortical regions in each hemisphere in relation to mental processes.⁵ The third development is more conceptual than technological. There has been a convergence of neurobiology, psychology, and computer science, focused passionately (pro and con) around the ideas of parallel distributed processing. Whether it is truly a new paradigm or simply a unifying metaphor, it has promoted the development of a common language and concepts among these disciplines, and that has been very productive. It has already led to a much greater interest in systems as a whole and the interaction of their parts, rather than simply in the parts per se.

My present project,⁶ a broad theoretical consideration of "wholeness" in people, is a direct continuation of the earlier ideas. Many other disciplines have tackled this topic, usually under the rubric of "Self." I am adding the perspectives of neurobiology and cognitive psychology.

1. Bogen J E. Partial hemispheric independence with the neocommissures intact. (Trevarthen C, ed.) *Brain circuits and functions of the mind; essays in honor of Roger W. Sperry*. Cambridge, England: Cambridge University Press, 1990.
2. Galin D. Lateral specialization and psychiatric issues: speculations on development and the evolution of consciousness. *Ann. N.Y. Acad. Sci.* 299:397-411, 1977.
3. Galin D, Diamond R & Braff D. Lateralization of conversion symptoms: more frequent on the left. *Amer. J. Psychiat.* 134:578-80, 1977. (Cited 45 times.)
4. Galin D, Johnstone J, Nakell L & Herron J. Development of the capacity for tactile information transfer between hemispheres in normal children. *Science* 204:1330-2, 1979. (Cited 25 times.)
5. Galin D. Conceptual and methodological issues in neuropsychological studies of depression. (Kinsbourne M, ed.) *Cerebral hemisphere function in depression*. Washington, DC: American Psychiatric Press, 1988.
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