

Light Into the Black Box

A Review of

Cerebral Laterality: Theory and Research: The Toledo Symposium

Frederick L. Kitterle (Ed.)

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Reviewed by

[Marcel Kinsbourne](#)

The early laterality paradigms conveyed a heady promise—to reveal aspects of cerebral structure in intact humans with noninvasive methodology. Appropriate and compliant humans abound on college campuses, and the technology was not forbidding. Thus, many academic psychologists, armed with tachistoscope or the like and some dichotomizing concepts about the hemispheres of the brain, launched headlong into a normative neuropsychology. Entangled in the work and complicating it were those perennial favorites, gender and handedness; soon, sweeping generalizations based on handfuls of sophomores differing on these enticing subject variables were formulated. The subsequent hyperbolic extensions of the findings into fancies of hemisphericity and their commercial exploitation do not need to be reviewed here because these are dying down. However, serious laterality research continues with increasing emphasis on issues of methodology that characterize each new direction in psychological research as it matures over time.

Although the contributions to this edited volume are within the laterality framework, they are quite diverse. The first four tackle complex interactions of peripheral and central laterality with age and gender across species within the primate order. Ward presents evidence for stable left-hand preference for some prosimians and maturing right-hand preference for others. Whole-body turning biases appear to be uncorrelated with hand preference in prosimians and humans. Prosimian laterality may be less a model for human laterality than an intriguing problem in itself. After decades of earnest inquiry, however, human hand preference resists more than a superficial understanding with its degree and direction and gender and environment still intertwined (Bryden and Steenhuis). Centrally, the two hemispheres of split-brain monkeys show stable specializations but ones that only partly fit the usual human patterns (Hamilton and Vermire). Humans and other primates have in common that they are functionally lateralized; however, they are not necessarily lateralized the same way. Lateralized performance has its own complexities. Taking as a case in point the left-handers' slight deficit on some spatial tests, McKeever comes up with baffling higher order interactions of spatial skill, hand preference, and familial handedness.

In-depth analyses of individual paradigms follow. In the context of lexical decision, Hardyck resists the standard view that verbal information presented to the left visual field suffers degradation during shunting to the left hemisphere. Working with a split-brain subject, Sergent and Corballis display the merits of analyzing the task into components and attributing laterality to a component rather than to the task as a whole. Kitterle and Christman better define the boundary conditions

within which the embattled differential spatial-frequency effect in laterality can be reliably obtained. Further help may come from the use of computer models to show how the interaction between relevant cognitive subsystems can generate the observed laterality effects (Van Kleeck and Kosslyn). Hellige attempts a diagnostic for turn taking between the hemispheres, depending on which can more efficiently execute the task in question, an issue to which modeling could be applied with an advantage.

Two remaining chapters focus on event-related measurement, electrophysiological (Molfese and Burger-Judisch) and metabolic (Wood, Flowers, and Naylor), respectively. Both methodologies have the potential of reaching beyond the conventional right-left difference toward a more articulated account of unilateral and bilateral cerebral participation in cognitive processing changing in an orderly fashion over time.

Laterality research has outgrown the early facile enthusiasms. It is gratifying to see how well it is being pursued in the long haul.

Frederick L. Kitterle, professor of psychology and dean of the College of Liberal Arts at Stephen F. Austin State University (Nacogdoches, Texas), is editor of the forthcoming *Hemispheric Communication: Mechanisms and Models*.

Marcel Kinsbourne, research professor at Tufts University (Medford, Massachusetts) and consultant neurologist at Boston University (Massachusetts), is coeditor, with W. L. Smith, of *Hemispheric Disconnection and Cerebral Function* and editor of *The Asymmetrical Function of the Brain and of Hemisphere Function in Depression: Progress in Psychiatry*.