

Self-recognition as a test of consciousness in left and right hemisphere of „split-brain“ patients

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In recent years studies in normal and brain damaged persons have confirmed earlier clinical findings indicating a lateral specialization of the human cerebral cortex. The description of this cerebral functional asymmetry has been predominantly in terms of dichotomies based on the superiority of one (the left) hemisphere in language related tasks. Despite the fact that language functions cannot altogether be denied to the right hemisphere some leading neuroscientists have tended to exaggerate the distinction between both cerebral hemispheres and distinguished between a speaking, conscious cortical half and a mute, automatically (i. e. unconsciously) functioning right cortical hemisphere. This implies that the left hemisphere, while not superior in all cortical functions, nevertheless is endowed with the more distinctively human faculties, being the "dominant hemisphere in liaison with the conscious self", in contrast with "the minor hemisphere with no such liaison" (Eccles, 1973, p. 214).

The phenomenon of self-awareness evades both a strictly experimental definition and a rigorous test. In this study recognition of one's own face was used as an indication of selfconsciousness. In experiments with normal subjects it was found that skin resistance [SR] changes as an index of arousal were greater and more persistent to the subjects' own faces, than to faces of unknown persons, of friends or of relatives (Preilowski, in prep.). In separate sessions, pictures of faces of the patients themselves, of their relatives, of political personalities and unknown persons,

as well as of objects and pets belonging to the patients' households and pictures of semi-nudes were presented to either hemisphere, while behavioral reactions and skin resistance changes were recorded. The inclusion of pictures other than those of the patients' faces were meant to be a control for the influences of familiarity and general emotional arousal.

Table 1. Mean skin resistance changes to the three categories of pictures. One unit of SR change represents 100 ohms. Standard errors of the means are given in parentheses.

Stimulus category	Mean skin resistance change on list presentation to			
	left hemisphere	right hemisphere	left hemisphere	right hemisphere
	of Patient N. G.		of Patient L. B.	
Emotional stimuli + familiar objects	20.00 (3.25)	16.00 (6.75)	20.20 (5.77)	14.40 (3.40)
Familiar faces	13.40 (6.29)	13.00 (3.06)	28.43 (3.36)	26.57 (7.62)
Patient's face	22.50 (8.02)	48.00 (6.65)	29.25 (10.80)	41.25 (12.37)

Long-duration exposure of stimuli to only one hemisphere was accomplished through the use of a collimator mounted on a contact lens, which was held to one eye by minimal suction. Through another lens system fixed above a working table anything visible on the table surface was projected through the pupil in fashion of a Maxwellian view. Covering one half of the collimator opening prevented stimulation of one hemi-retina without restricting visual scanning with that eye. The other eye was covered by an eye patch.

Despite a relatively large variability in SR responses to all categories of stimuli, both patients showed the largest responses to their own face. This phenomenon was most evident with right hemisphere presentation of the stimuli.

Although, with the exception of some instances for LB, the stimuli presented to the right hemisphere could not be verbally identified, the pattern of SR changes indicates that both patients were able to recognize their own face through this hemisphere. Thus it is necessary to assume the existence of conscious awareness in the "mute, minor" as well as in the "speaking, major" cortical half.

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