

Title	The Neural Interaction as a Physiological Basis of Simultaneous Brightness-Contrast
Sub Title	
Author	古崎, 敬(Kozaki, Takashi)
Publisher	三田哲學會
Publication year	1961
Jtitle	哲學 No.41 (1961. 12) ,p.A11- A11
JaLC DOI	
Abstract	
Notes	Abstract
Genre	
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00150430-00000041-0192

慶應義塾大学学術情報リポジトリ(KOARA)に掲載されているコンテンツの著作権は、それぞれの著作者、学会または出版社/発行者に帰属し、その権利は著作権法によって保護されています。引用にあたっては、著作権法を遵守してご利用ください。

The copyrights of content available on the KeiO Associated Repository of Academic resources (KOARA) belong to the respective authors, academic societies, or publishers/issuers, and these rights are protected by the Japanese Copyright Act. When quoting the content, please follow the Japanese copyright act.

The Neural Interaction as a Physiological Basis of Simultaneous Brightness-Contrast

Takashi Kozaki

The brightness of a field (a test field) can be decreased or increased, when it is surrounded by a brighter or darker field (an inducing field). This phenomenon is called 'brightness contrast'. It seems that this phenomenon is the result of a retinal inhibition. With respect to the neural mechanism of retinal inhibition, a series of investigations were conducted by Hartline and his co-operators. The results they obtained seem to offer profitable suggestions for the physiological understanding of brightness contrast.

In the present paper, an attempt has been made to summarize the psycho-physical and physiological aspects of brightness contrast and to examine their relationships (between brightness contrast phenomenon and retinal inhibition).

It has been shown that the magnitude of the inhibition, measured in terms of decrease in frequency of discharge, depends upon the intensity, area, and configuration of the pattern of illumination on the retina: (1) the greater the intensity on neighboring receptors, the greater the inhibition they exert on the test receptor; (2) the greater the number of neighboring receptors illuminated—that is to say, the larger the area of illumination, the greater the inhibition exerted on the test receptor; (3) illumination of neighboring receptors nearer to the test receptor results in greater inhibition than does illumination of more distant receptors.

Comparing psycho-physical facts with these physiological ones, if we replace respectively the word 'inhibition' in the above sentences with the word 'brightness contrast', 'receptor' with 'field', and 'frequency of discharge' with 'apparent brightness', such physiological facts would correspond with the facts of brightness contrast.