

Brightness and darkness as perceptual dimensions

October 19 2007

A common-sense assumption concerning visual perception states that brightness and darkness cannot coexist at a given spatial location. One corollary of this assumption is that achromatic colors, or perceived grey shades, are contained in a one-dimensional (1-D) space varying from bright to dark.

The results of many previous psychophysical studies suggest, by contrast, that achromatic colors are represented as points in a color space composed of two or more perceptual dimensions. The nature of these perceptual dimensions, however, presently remains unclear.

In a new study, publishing in *PLoS Computational Biology* on October 19, 2007, researchers Vladusich, Lucassen and Cornelissen from the University of Groningen and the Department of Human Interfaces, of the Netherlands, provide evidence that brightness and darkness form the dimensions of a two-dimensional (2-D) achromatic color space.

This color space may play a role in the representation of object surfaces viewed against natural backgrounds, which simultaneously induce both brightness and darkness signals. The researchers' 2-D model generalizes to the chromatic dimensions of color perception, indicating that redness and greenness (blueness and yellowness) also form perceptual dimensions. Collectively, these findings suggest that human color space is composed of six dimensions, rather than the conventional three.

Source: Public Library of Science

Citation: Brightness and darkness as perceptual dimensions (2007, October 19) retrieved 27 April 2024 from <https://phys.org/news/2007-10-brightness-darkness-perceptual-dimensions.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.