

UC Irvine

UC Irvine Previously Published Works

Title

Psychophysical dissociation of "how" and "what" tasks in normal participants

Permalink

<https://escholarship.org/uc/item/06t3r847>

Journal

Journal of Vision, 2(7)

ISSN

1534-7362

Authors

Chubb, C
Wright, CE
Anderson, S
[et al.](#)

Publication Date

2010-03-15

DOI

10.1167/2.7.58

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Psychophysical dissociation of “how” and “what” tasks in normal participants

[Charles Chubb](#); [Charles E. Wright](#); [Susan Anderson](#); [Peter Kim](#)

+ Author Affiliations

Journal of Vision November 2002, Vol.2, 58. doi:<https://doi.org/10.1167/2.7.58>

Abstract

Purpose: Milner & Goodale, 1995, propose that visual processing splits into a ventral, “what” stream devoted to conscious recognition processes and a dorsal, “how” stream mediating motor control. Whereas the ventral stream receives input from both the magnocellular and parvocellular pathways, the dorsal stream receives only magnocellular input, suggesting that the “how” system may lack chromatic sensitivity. Here we assess the relative sensitivities to luminance versus chromatic variations in distinct tasks designed to selectively engage these two processing streams. Method: Taskwhat required the subject to register with a buttonpress the orientation (right, left, up or down) of a foveal isocetes triangle, briefly flashed, then masked. Taskhow required the subject to touch with a stylus the tip of the most acute angle of an isocetes triangle presented randomly in one of 4 orientations at one of 4 parafoveal locations. Each task used (i) equiluminant green targets varying in saturation, and (ii) isochromatic gray targets varying in luminance. Psychometric functions of green-target saturation and of gray-target luminance were obtained in Taskwhat. In Taskhow we measured movement duration and endpoint accuracy. Results: For saturation Green(p) and luminance Gray(p) yielding identical success rate p in Taskwhat, Green(p) targets yielded movement trajectories in Taskhow that were significantly slower and/or less accurate than Gray(p) targets. Conclusions: The process mediating performance in Taskwhat is relatively more sensitive to chromatic (vs. luminance) variations than the process mediating performance of Taskhow, supporting the dual claims that (i) Taskwhat and Taskhow selectively activate the “what” and “how” systems, and (ii) the “what” system is relatively more sensitive to chromatic variations than the “how” system.

Chubb, C., Wright, C. E., Anderson, S., Kim, P.(2002). Psychophysical dissociation of “how” and “what” tasks in normal participants [Abstract]. *Journal of Vision*, 2(7): 58, 58a, <http://journalofvision.org/2/7/58/>, doi:10.1167/2.7.58. [[CrossRef](#)]