SOCIETY FOR NEUROSCIENCE
1997 ABSTRACT FORM

Read all instructions before typing abstract.
See *Call for Abstracts* and reverse of this sheet.
Complete abstract and **all boxes**
at left and below before making copy
(Please type or print in black ink.)

_____ Check here if this is a **REPLACEMENT** of abstract submitted earlier. Remit a nonrefundable **$40** for each replacement abstract. Replacement abstracts must be **RECEIVED** by Tuesday, May 6, 1997.

First (Presenting) Author

Provide full name (no initials), address, and phone numbers *of first author on abstract. You may present (first author) only one abstract.* (Please type or print in black ink.)

David C. Somers, Ph.D.
Dept. of Brain & Cogntive Sciences
M.I.T., E10 - 120
79 Amherst St.
Cambridge, MA 02139 (617) 253-8335
Office: 617) 258-9412 Home: 617) 648-4792
E-mail: somers@psyche.mit.edu

SMALLEST RECOMMENDED TYPE SIZE: 10 POINT

SAMPLE:
1997 Annual Meeting
New Orleans, La.
Oct. 25–30, 1997

POSTMARK DEADLINE:

FRIDAY, APRIL 25, 1997

Presentation Preference

Check one: ☒ poster ☐ slide

Themes and Topics

See list of themes and topics, pp. 17–18. Indicate below a first and second choice appropriate for programming and publishing your paper.

1st theme title: Sensory Sys. theme letter: F
1st topic title: Visual Cortex: striate topic number: 88

2nd theme title: Sensory Systems theme letter: F
2nd topic title: Visual Psychophys & Behavior topic number: 90

Special Requests (for example, projection, video, or computer requirements)

Include nonrefundable **abstract handling fee** of **$40.** Fill out payment information form below. Purchase orders will not be accepted. Submission of abstract handling fee does not include registration for the Annual Meeting.

An asterisk must be placed after the sponsor's (signing member) name on the abstract.

A FUNCTIONAL MAGNETIC RESONANCE IMAGING INVESTIGATION OF APPARENT BRIGHTNESS PERCEPTION. D.C. Somers*, A.M. Dale†, J.D. Mendola†, E.H. Adelson, R.B.H. Tootell†, Dept. of Brain & Cognitive Sciences MIT, Cambridge, MA. MGH–NMR Center†, Charlestown, MA.

A gray patch viewed on a dark background appears brighter than the same patch viewed on a bright background. This brightness illusion is generally thought to result from local edge contrast polarity. We (Adelson '93; Somers & Adelson '97) have developed stimuli which generate much stronger apparent brightness effects without altering local border contrasts. Each stimulus consists of a central disk (3° diam.) surrounded by 2 annuli (6°, 9° outer diam.) with hemi-ellipses aligned in X–junction configurations along the border between the annuli. Experimental and control stimuli had identical luminance configurations within the central disk and inner annulus. Luminance values of the hemi-ellipses in the outer annulus were modulated to create X–junctions that were consistent with transparency (experiment) or opacity (control). Experimental stimuli generated a strong apparent brightness modulation of the central disk as compared to the control stimuli. Subjects viewed these stimuli during echo-planar imaging at 1.5T or 3T (GE Signa). Retinotopy of visual areas V1, V2, V3, VP, V3A, V4v was identified by previously described methods (Sereno et al., '95). In one subject scanned at 3T we observed strong decreased activation at the central retinotopic representation in V1 and V2. Small patterns of increased activation were also observed at eccentricities corresponding to the outer annulus. At 1.5T a similar, but weaker pattern of activation and deactivation was observed in a second subject. Decreased activation in the cortical representation of the central disk correlates with decreased single-unit responses recorded in macaque V1 using similar apparent brightness stimuli (Mazer et al. '97). Decreased responses may reflect the effects of scission on edge detectors positioned within the region of the transparent surface or may reflect contrast polarity–specific effects of X–junctions.

Key Words: (see instructions p. 4)

1. NMR Imaging
2. Visual Cortex

Signature of Society for Neuroscience member required below. ***No member may sign more than one abstract. The signing member must be an author on the paper and an asterisk must be placed after the sponsor's (signing member) name on the abstract.***

The signing member certifies that any work with **human or animal subjects** related in this abstract complies with the guiding policies and principles for experimental procedures endorsed by the Society. This signature acknowledges that each author on this abstract has seen and approved the final version of the abstract and has given consent to appear as an author. Abstracts must comply with ethical guidelines for human and animal research, and authors may be asked to supply added documentation.

Society for Neuroscience member's signature

David C. Somers
Printed or typed name

(617) 258-9412
Telephone number