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12. PERSONAL AUTHOR(S) Nakayama, K.			
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17. COSATI CODES FIELD GROUP SUB-GROUP		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) We have investigated a number of paradigms where odd targets have to be either detected or discriminated and where set size, prior knowledge of target identity, and other factors were varied. We have set up an eye movement monitoring experiment to use the speed and accuracy of saccades to supplement the psychophysical observations described above. We have been examining the phenomenon of color (or brightness) spreading, developing a paradigm to show that the filling of color could be interrupted by using an after-coming patterned mask. We are also making neural models to account for the psychophysical observations as they emerge. <i>Keywords: Visual Search, Eye movements, (Saccades)</i>			
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Participating Professionals

Ken Nakayama, Ph.D.
Shinsuke Shimojo, Ph.D.
Manfred Mackeben, Ph.D.
Mary Bravo, Ph.D.
Michael A. Paradiso, Ph.D.

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Research Objectives:

Study on focal visual attention, eye movements, and color spreading.

Status of Research:

Eye movement measurements using our new eye-tracker are just beginning (set up by Dr. Manfred Mackeben) and will be used in a visual search task.

Visual search tasks will continue to be studied in conjunction with Dr. Mary Bravo.

Studies of color filling and neural modeling continue in collaboration with Dr. Michael A. Paradiso.

Dr. Shinsuke Shimojo has returned to Japan, taking the position of Associate Professor of Psychology, University of Tokyo. He continues our collaboration through frequent visits. We are writing our occlusion research for a book, most probably to be published by M.I.T. Press.

Manuscripts:

One of our major goals of the past year is to write up a large amount of work completed but not published. Over the past year, the following manuscripts have been accepted, or have appeared.

Nakayama, K., Shimojo, S. and Silverman, G.H. Stereoscopic depth: its relation to image segmentation, grouping, and the recognition of occluded objects. *Perception* **18**, 55-68, 1989.

Paradiso, M.A., Shimojo, S., and Nakayama, K. Subjective contours, tilt aftereffects, and visual cortical organization. *Vision Res.* **29**, 1205-1213, 1989.

Nakayama, K. and Mackeben, M. Sustained and transient components of focal visual attention. *Vision Research* (In press).

Nakayama, K., Shimojo, S., and Ramachandran, V.S. Transparency: relation to depth, subjective contours, and color spreading. *Perception* (In press).

Shimojo, S. and Nakayama, K. Real world occlusion constraints and binocular rivalry interaction. *Vision Research* (In press).

Nakayama, K. and Shimojo, S. DaVinci stereopsis: depth and subjective contours from unpaired monocular points. Vision Research (In press).

Oral Presentations (selected oral presentations are listed below):

1. "Image Motion Processing: Beyond sequence detection", Festschrift symposium for Torsten N. Wiesel, Houston, TX, April 15, 1989. (K. Nakayama)
2. "Depth, subjective contours and transparency: relation to neon color spreading", poster presented at ARVO, Sarasota, FL, May 2, 1989 (K. Nakayama, S. Shimojo and V.S. Ramachandran)
3. "Masking with contours suppresses the filling in of color", ARVO, Sarasota, FL, May 4, 1989 (M. Paradiso and K. Nakayama)
4. "Real world occlusion constraints and the perception of color, form, motion and depth", Departmental Colloquium, University of California, San Diego, CA, May 11, 1989 (K. Nakayama)
5. "Occlusion constraints and the encoding of color, form, motion and depth", Conference on Vision and 3-D Representation, University of Minnesota, Minneapolis, MN, May 24, 1989 (K. Nakayama)
6. "Occlusion constraints and binocular vision", Festschrift symposium for Gerald Westheimer, Berkeley, CA, August 11, 1989 (K. Nakayama)
7. "Mechanisms of cortical filling in", Department of Psychology, Brown University, Providence, RI, August 22, 1989 (M. Paradiso)
8. "Mechanisms of cortical filling in", Stanford Research Institute, Palo Alto, CA, September 21, 1989 (M. Paradiso)

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9. "Focal visual attention" and "Neural representation of occluded surfaces", Visiting scholars program, School of Optometry, Department of Physiological Optics, University of Alabama at Birmingham, AL, October 5, 1989 (K. Nakayama)
10. "Psychophysics of the aperture problem and other motion phenomena", Symposium presented at the Society of Neurosciences meeting, Phoenix, AZ, November 1, 1989 (K. Nakayama)
11. "Color filling: psychophysical evidence and a neural network model", Society of Neurosciences meeting, Phoenix, AZ, November 3, 1989 (M. Paradiso)
12. "Visual representation of occluded surfaces", Department of Psychology, Stanford University, Stanford, CA November 8, 1989 (K. Nakayama)