

Danielle Hickey Photo Editor

University psychology Professor Edward Vogel's study, demonstrating for the first time a direct relationship between brain nerve activity and memory capacity, appeared in the April 15 issue of Nature magazine.

## STUDY

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tasks such as reasoning, mathematics and following directions."

The results of Vogel's research were published in the April 15 issue of Nature magazine.

Using electrodes placed on the scalp, Vogel and Machizawa collected data suggesting that neural activity can reveal the limitations of awareness — the visual working memory for each person — and provides a window into how the brain controls

our cognition.

In their research, Vogel and Machizawa showed subjects a display with a number of objects on it. They then waited and showed subjects two cards; one identical to the first display and another with a change in the color of one of the objects. They asked subjects to point out the original set of objects while recording the subjects' neural activity.

Subjects were successful in four trials, but were less successful picking the correct set after a fifth object was added. Neural activity increased with the addition of each object

until the fourth or fifth was added, at which point neural activity leveled as subjects struggled to remember the correct set.

According to Vogel, the research opens the door to studying how people hold objects in their awareness. Vogel is not the only scientist who sees the research's potential.

University Associate Professor of psychology Ed Awh, who studies cognitive theory, said there are many uses for research into the human cognitive process, including some practical applications.

"We have a limited number of tools

in cognitive neural science," Awh said. "People for decades have worked with a small number of processes, but this will open up a huge amount of applications. If we can develop more models of short-term cognitive theory, then we can develop theories about cognitive diseases like (attention deficit disorder)."

Awh said the research may also help with other attention problems or with skills requiring attention, like learning or flying a plane.

Vogel said he first stumbled into researching visual awareness while working on experiments in the mid-1990s at the University of Iowa.

"We were interested in some other experiment," he said. "I don't even remember what it was, and we realized that it would be really useful to be able to study this one thing if we knew what the capacity of the visual working memory is. We realized it hadn't been done."

Vogel said visual processing happens within a few hundred milliseconds after light enters the eye in a process of identification, memory building and recognition.

Machizawa, who did his undergraduate work at the University, met Vogel while looking for opportunities to research event-related potentials, or how scientists measure the brain's electrical activity as it corresponds to experiments.

Machizawa said he is surprised by the attention the research has garnered.

"I never dreamed of it, but I think it's cool," Machizawa said. "In terms of publishing in Nature, for the scientific field, that's very good."

Others in the field agree that having research findings published in a scientific journal like Nature is momentous. "Nature and Science are the two premier journals as far as scientific research goes," Awh said.

"To be published in them is to be published in one of the most prestigious spots."

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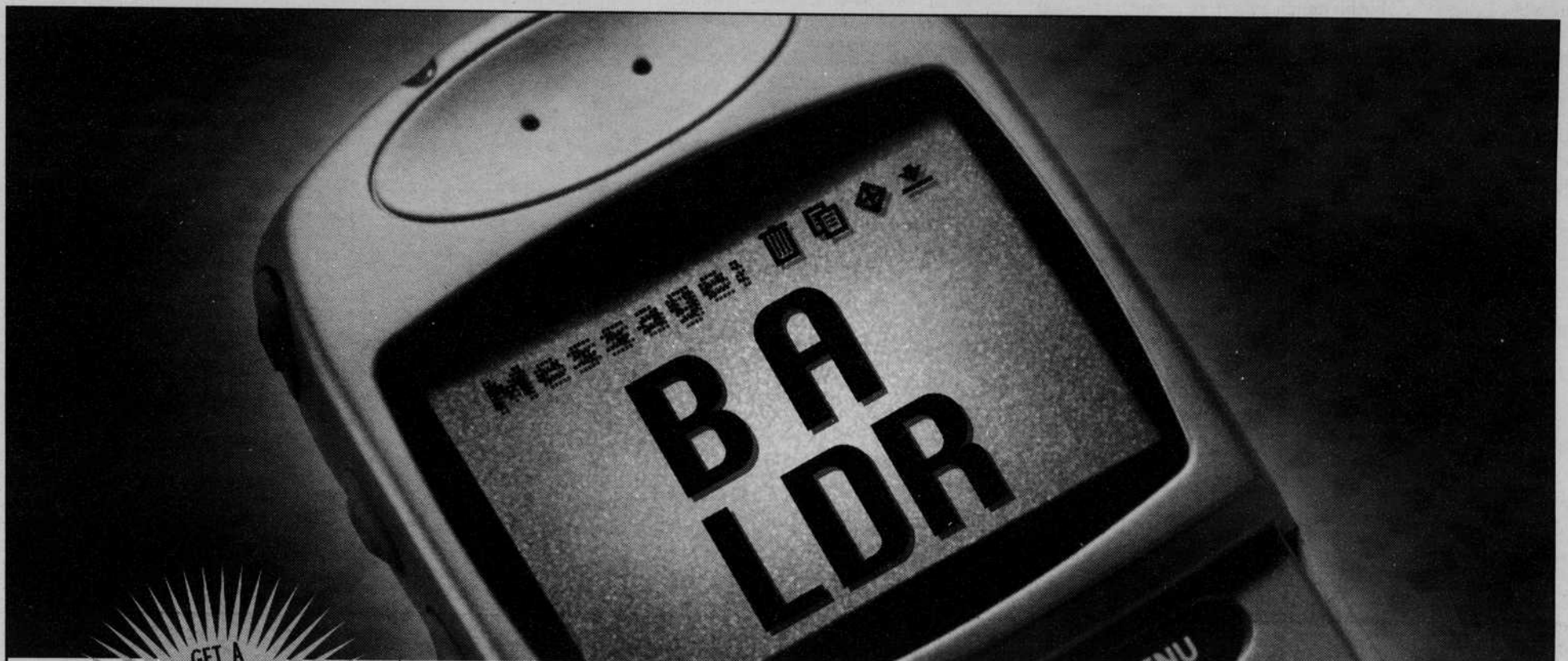
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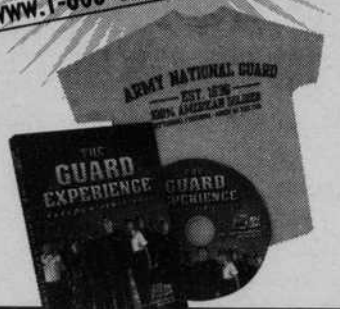
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