

The Psychological Science Agenda



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With NIH at a Crossroads, Zerhouni Makes an Appearance at NIDA

by Geoff Mumford

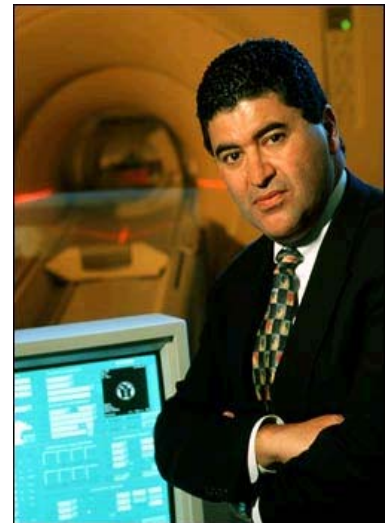
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On May 18, NIH Director Elias Zerhouni gave a presentation to the National Institute on Drug Abuse (NIDA) Advisory Council to try and allay some concerns and counter some myths circulating in the extramural research community.

The presentation followed not long after a round of Congressional hearings during which Zerhouni was asked to describe what health benefits had accrued to the Nation by doubling the budget of the NIH. But those aren't the questions the research community is concerned about...scientists want to know why their grant proposals aren't faring as well as they used to.

The answer, according to Zerhouni, relates to several factors that have all coalesced to create what he described as a Perfect Storm. The overarching problem, of course, is the budget. But are individual investigators feeling the pinch because NIH is over-investing in translational research, or spending too much on big projects at the expense of ROI's, or funneling too much money into the Roadmap initiatives? No, no and no would come Zerhouni's reply and he provided data to show that the ratio of basic to applied research has remained relatively constant over the last decade; that unsolicited ROI's have been funded at high and consistent rates during that same period; and that Roadmap activities only amount to



0.8% of the NIH budget.

So what is really happening? Apparently it took some time for the research community and research institutions to build the capacity to take advantage of the doubling that ended in 2001 (Zerhouni quipped that there's an informal competition amongst medical schools comparing themselves by the number of cranes they have on campus). So the real squeeze scientists are feeling now is the result of the surge in grant submissions that occurred in 2003, the failure of NIH budgets to keep up with inflation, and the roughly 4 years it takes for resources to become available as one slate of grants are terminated and a new set of awards begins.

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EXECUTIVE DIRECTOR'S COLUMN

STEVEN BRECKLER, Executive Director for Science

Red Alert

2 **J**ust a few months ago (February), I used this space to comment on the President's newly proposed American Competitiveness Initiative (ACI). Aimed at increasing investments in basic physical science and engineering research, this initiative would include a doubling of the National Science Foundation (NSF) budget over the next 10 years.

I am completely in favor of doubling the NSF budget – doing it over 10 years may not be fast enough. The greatest threats and challenges we face as human beings and as a nation require an increasing investment in basic science.

The concern I expressed in February was that growth for some areas of science (math, physical science, engineering, technology) should not come at the expense of other areas, especially the biological, social and behavioral sciences.

I heard from a number of readers about this. Some called me cynical, others paranoid. They wondered why I was being critical of an initiative that could be good for many fields of science, and good for America.

At the time, I was merely expressing a healthy dose of skepticism. For those who are fond of color-coded alert systems, I was suggesting that we move from Blue Alert (our usual guarded level of threat) to Yellow Alert (an elevated level of threat). Not that any dramatic action was needed, only that we needed a little extra vigilance. A remote threat could be detected on the horizon.

The situation changed on May 2, when the Senate Commerce Committee's Subcommittee on Science and Space



held a hearing on "NSF's Fiscal Year 2007 budget request, research priorities, current plans and activities, and its support for the American Competitiveness Initiative and related activities." Presiding over the hearing was Senator Kay Bailey Hutchison (R-TX).

It was clear from the outset that some members of the subcommittee do not want NSF to use any increase in its budget for the support of social or behavioral science. Some even questioned whether NSF should be supporting social and behavioral science at all. **ORANGE ALERT!** This kind of talk is good reason for us to consider ourselves as moving to a high level of threat.

Those of us who spend our days here in Washington advocating on behalf of social and behavioral science were concerned. We began to mobilize our troops, ready to take action if needed.

Then on May 16, word spread rapidly that Senator Hutchison was planning to introduce an amendment to Senate Bill 2802, which lays the groundwork for the ACI. The amendment would instruct NSF not only to assess the degree to which grant proposals contribute to the enhancement of physical science, technology, engineering and mathematics, but also to give priority to them.

RED ALERT! We suddenly moved to a severe level of threat. Although the anticipated amendment does not say so directly, its language and intent is clear: when it comes to funding the American Competitiveness Initiative, NSF should not be directing any dollars to social and behavioral science research.

Why is this a threat? For one thing, new initiatives are rarely fully funded. To deliver on their promise often requires the redirection of other funding. In this case, the stage is being set to redirect funding of social and behavioral science to other fields of science. This is precisely the concern I expressed in February.

The larger concern, however, is the threat this represents for the entire enterprise of social and behavioral science. It is clear that some lawmakers hold our areas of science in great disdain. Some would like to see the social and behavioral science programs of NSF removed entirely from its portfolio. Other than its general interest value, they fail to appreciate the importance of and need for basic research in social and behavioral science.

On May 17, APA and our partner organizations issued an action alert – a call to action for psychologists and others to speak up, and to let their representatives know how they feel about these legislative actions. By all accounts, the field responded.

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SCIENCE BRIEFS

Picking Up the Check When it's Time to Pay Attention

by David Washburn



David A. Washburn is Professor of Psychology and Director of the Language Research Center at Georgia State University, from which he received his PhD in 1991. His research is broadly focused on the emergence of cognitive competence. More specifically, he and his collaborators investigate the significance of individual and group (including species) similarities and differences in attention, executive functions, and learning. This research enjoys current and recent support from the NIH, the U. S. Army Medical Corps and Materiel Command, the Federal Aviation Administration, and other agencies. Additional information about this research and his Individual Differences in Executive Attention (IDEA) laboratory can be found at <http://www.gsu.edu/psychology>.

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The air fills with characteristic tones and tunes that accompany the newest computer game. The screen sparkles with colorful graphics and action. A hand deftly controls a joystick. Eyes remain transfixed on the display. Minutes pass. Hours pass. Oblivious to the rest of the world, all attention is directed to the task of completing the next level or setting the high score.

It is a scene repeated daily in bedrooms or game-rooms across the country. In this particular instance, however, the location is a laboratory at Georgia State University's Language Research Center rather than a home; and the hand on the joystick belongs to a rhesus monkey, not a person.

Almost to the day, it has been 20 years since we discovered that rhesus monkeys (*Macaca mulatta*) and other nonhuman primates could learn to manipulate a joystick in game-like computerized tasks so as to respond skillfully to computer-generated stimuli (Rumbaugh, Richardson, Washburn, Savage-Rumbaugh, & Hopkins, 1987; Savage-Rumbaugh, 1986). At our

laboratory and dozens of others, many of the classic tests from comparative psychology, cognitive psychology, developmental psychology, and neuropsychology have been translated into computer programs—much as has become common in research with humans—that look like simple video games. Although Sony and Nintendo will never fear the graphics and complexity of these games, monkeys and apes find the tasks to be highly motivating and enriching. Our



A rhesus macaque manipulates a joystick to respond to game-like cognitive tasks

monkeys have continuous access to the computerized tasks, and thus can work whenever they want or rest whenever they want. In doing so, they control their intake of fruit-flavored chow pellets, although they receive food freely whether or not they engage the tasks, and are never reduced in body weight or food-deprived for purposes of testing. Perhaps more importantly, the animals can in this way control their level of stimulation, challenge, and activity. These game-like computer tasks provide a significant means for promoting and assessing the psychological well-being of the nonhuman primates (Washburn, 2003, Washburn & Rumbaugh, 1992), and the monkeys (like many humans) spend many hours each day in rapt attention to the tasks.

The Control of Attention

But what does this say about the nature of attention itself? Monkeys and children are engrossed by television and computer games, but some of these same children struggle to pay attention in other contexts, like school. Is an

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organism's capacity for attention better characterized by these inattentive instances or by those hours in which attention is captivated by entertainment?

4 With support from the National Institute of Child Health and Human Development, we have been studying the nature and development of attention in monkeys and humans, using game-like computer tasks like those referenced above to identify what attention is, how it is controlled, and how to improve its effectiveness. The term *attention* describes a collection of cognitive processes involved in the orientation to and selection of particular stimuli or responses to process, the concentration or mental effort dedicated to this processing, and the state of alertness or readiness to process additional stimuli. Evidence from experimental studies, psychometric studies (e.g., Mirsky, Pascualvaca, Duncan & French, 1999; Stankov, 1988), and neuroscientific studies using fMRI (Fan, McCandliss, Fossella, Flombaum, & Posner, 2005; Posner & Raichle, 1994) reveals the construct of attention to be comprised of separate factors or subsystems (e.g., attention focusing, attention scanning, attention sustaining) that are associated with distinct brain networks (e.g., an executive attention network, including prefrontal brain regions and particularly the anterior cingulate gyrus; an alerting network involving the coordination of temporal and parietal regions of the right hemisphere) and neurotransmitter systems.

Our research with monkeys has targeted the question of what determines, on a moment-by-moment basis, what an organism will attend to (as reflected in its behavior). We have found that the control of attention is competitively determined, a result of the constant battle that exists between what we term

Environmental constraints on attention: sudden changes in stimuli, movement, and novelty elicit a capture of attention

Experiential constraints on attention: conditioning (habits) and priming exert

stimulus-control over attention

Executive constraints on attention: intentions, instructions, and goals exert endogenous control over the locus and intensity of attention

In other words, what we attend to at any moment depends on the relative potency of the stimuli in the environment, the strength of our associative history with those stimuli, and the capacity we have at that moment for over-ruling these exogenous influences by volition (see Washburn & Tagliabue, 2006). What appears to distinguish monkeys from humans with respect to attention is NOT that humans have attention and monkeys do not—monkeys certainly can and do evidence attention in virtually every familiar task used to study the construct (e.g., visual search, Stroop, cuing and anti-saccade tasks, dual-task performance). Rather, it appears that, relative to typical humans, monkeys are much less effective in resisting strong environmental or experiential cues in favor of executive constraints on attention. Even when incentives and instructions dictate that a monkey should maintain its focus, these animals are easily distracted by stimuli that suddenly appear in the environment or that are prepotent by virtue of an extensive reward history for the animals. In contrast, most humans, when they are really motivated, are relatively better at resisting distraction and staying on task.

Consider the Stroop task, in which one must name the color in which a word is printed and ignore the meaning of the word, which itself may be the name of a color that is congruous (the word "BLUE" printed in blue) or incongruous (the word "RED" printed in blue) with the response (which is "blue" in both of these examples). Executive constraints, dictated by the task instructions, are to report the word color, but strong experiential constraints (the strong habit of reading the word) compete with these responses. Human adults and children show characteristic effects under these conditions: responses are slower and

frequently less accurate on incongruous trials than on congruous trials. Tested on a version of this task, rhesus monkeys also show this Stroop effect; however, the magnitude of the interference by the incongruous condition is much greater for monkeys than for humans (Washburn, 1994). One can further manipulate the potency of these competing constraints, such as by varying the proportion of congruent (Kane & Engle, 2004). The greater the proportion of congruent trials, the more the habit of reading the word is reinforced; the greater the proportion of incongruent trials, the more the executive constraints are emphasized. Responses by monkeys to their version of this task show big effects of making the experiential constraints more potent; however, monkeys benefit significantly less than do humans from manipulations that strengthen the cues for executive attention in this task.

The attentive monkey, the attentive child

Relative to humans, it is not that monkeys have less attention but rather that they have less executive control over attention. This is significant because it suggests the hypothesis that relative to adults, it is not that children have less attention but rather that they have less executive control over attention. Relative to typical populations, it is not that individuals with attention deficits have less attention (or broken attention) but rather that they have less executive control over attention. These potential parallels raise an intriguing question: Can the capacity for executive-attention by monkeys be improved with particular types of practice or instruction?

Monkeys do not naturally attend to boring things. If a stimulus does not capture attention by means of novelty or suddenness, or if the stimulus is not strongly associated with food, threat, pleasure, and so forth, a monkey is disinclined to attend to it. However, we have seen improvements in our

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monkeys' vigilance even to boring tasks with their computerized test-system experience. We are attempting to identify the conditions under which the monkeys will become more resistant to stimulus cues and more capable of executive attention.

In a parallel project, Mary Rothbart, Michael Posner, and their collaborators at the University of Oregon have been examining the development of executive attention in young children. A volume, *Educating the Human Brain*, based on this work will be published by APA books this fall. With initial funding from the McDonnell Foundation and NIMH, these scientists developed a series of computer exercises for toddlers, modeled after the tasks we used to train rhesus monkeys (Rumbaugh et al., 1987; Washburn, 2003). They have recently published results of attention training for 4- and 6-year-old children (Rueda, Rothbart, Saccamanno, & Posner, 2005). They found that a brief five day training showed positive gains in executive attention, IQ and in the underlying executive attention network as recorded from scalp electrodes. The programs are freely available on the web at www.teach-the-brain.org. These investigators are currently working with others to test these ideas, introducing the activities to additional normal children as well as those suffering from disorders that, like ADHD and Autism, involve attentional networks.

Together with Brad Sheese, Rothbart and Posner are also conducting a longitudinal study, from age 7 months to 4 years of age, to determine the origins of executive attention in infancy. Preliminary results suggest a connection between executive attention and anticipatory eye movements found when infants are presented a series of stimuli in fixed locations on a computer screen. The attention training studies showed vast individual differences among even young children in the ability to control their attention. Evidence for the involvement of dopamine genes in these differences is being followed up in the current

longitudinal study. The eye movement and genetic studies provide means to further the connections between human and monkey research.

This type of collaboration, in which findings from research with nonhuman animals produce principles that may be applied to improving child health and human development, follows a formula for success established decades ago. Then, it was language research with chimpanzees and bonobos at the Language Research Center that generated fundamental knowledge about what language is and how it could be learned by animals that do not naturally demonstrate such competencies (Rumbaugh & Washburn, 2003; Savage-Rumbaugh, 1986). This knowledge in turn was applied with outstanding results to interventions with nonspeaking human children with mental retardation (Romski, 1989; Romski & Sevcik, 1996).

Even as these ape-language studies continue at the Language Research Center, our hope is that the present research will continue to be successful in gleaning knowledge from a species that does not readily show executive attention and applying that knowledge to human children and adults who may also struggle in this area.

Acknowledgments

This research is supported at Georgia State University and the University of Oregon by the grant HD-38051 from the National Institutes of Child Health and Human Development. Additional support for this project has been provided by the McDonnell-Pew Foundation, the National Aeronautics and Space Administration, National Institute of Mental Health, and by Georgia State University. Tom Putney, Sandy Kleinman, Kimberly Espy, Duane Rumbaugh, and a host of outstanding graduate assistants contribute richly to the success of this research.

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Washington Goes to SIOP

by Heather Kelly

6 **H**eather Kelly, from Science's Public Policy Office, led an invited Continuing Education workshop at the Society for Industrial and Organizational Psychology (SIOP) conference in Dallas on May 6th. In "SIOP Goes to Washington: Advocating for I-O Psychology," Kelly gave participants a broad overview of how and when I-O psychologists can weigh in on relevant issues within their own organizations (including APA, universities, corporations and other workplace settings), local communities, and state and federal government. This included interactive discussions about Science PPO's engagement with APA divisions around policy issues, the federal legislative process, strategies and concrete skills for I-O psychologists to use in advocating for their science, and short- and long-term opportunities for putting these advocacy skills into practice.

Little did participants know that they would be pressed into service so quickly! Kelly sent them and the larger APA science community an urgent action alert on May 17th requesting that those living in states with Senators



on the Commerce Subcommittee on Science and Space call immediately to block a troublesome legislative amendment proposed by Sen. Kay Bailey Hutchison [(R-TX), see Executive Director's column on page 3)]. Sen. Hutchison planned to introduce the amendment on May 18th to a Senate bill being drafted (S. 2802) on the topic of American competitiveness and innovation, and the amendment included language excluding social and behavioral science from any increased funding directed to the National Science Foundation (NSF). New SIOP advocacy workshop "alumni" were quick to respond, and a compromise amendment was worked out with Democratic Senators making clear that all sciences should continue to receive strong support at NSF. ■

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On May 18, word spread that a compromise had been worked out in the Senate – that Senator Hutchison's amendment would not be offered after all, but that she and Senator Frank Lautenberg (D-NJ) had crafted a different amendment. This new amendment would clarify that in giving priority to some fields of science, no bias or restrictions be placed on any other fields of science that fall within the agency's mission.

As I write this, we do not yet know the final outcome of any of this legislation. Let's consider ourselves fairly warned. The effort to drive social and behavioral science out of the federal funding portfolio will continue, and we need to marshal our resources in response. ■

Upcoming Deadline: APF/COGDOP Graduate Research Scholarships

Promising graduate students are invited to apply for one of the graduate research scholarships offered by the American Psychological Foundation (APF) and the Council of Graduate Departments of Psychology (COGDOP). The purpose of this scholarship program is to assist graduate students of psychology with research costs. To be eligible for these prestigious awards, students must be enrolled in an interim master's or doctoral program in a COGDOP member department.

The application deadline is June 26, 2006. Applications **must include an official application form**, a letter of recommendation from the nominee's graduate research advisor, an outline of the nominee's thesis or dissertation research project, and a vitae. Application forms and detailed instructions are available at www.apa.org/science/apf-cogdop.html

Hot off the Press: NIH tells Congress basic behavioral research is well supported

by Pat Kobor

On May 15, the Director of NIH, Elias Zerhouni, sent a report to Senators Arlen Specter (R-PA) and Tom Harkin (D-IA) responding to congressional concerns about NIH's support of basic behavioral and social sciences research (<http://www2.apa.org/ppo/nihbssr506.pdf>). NIH had been asked to provide a report detailing its progress to the Chairman and Ranking Minority Member of the House and Senate Appropriations Committees in Report No. 109-337, the conference agreement that provided funding for NIH for Fiscal Year 2006.

Several members of Congress had expressed concern that the National Institute of General Medical Sciences, whose mission is to fund basic research at NIH, has traditionally funded almost no basic behavioral or social sciences research. U.S. Rep. Brian Baird (D-WA) and Patrick Kennedy (D-MA) organized several colleagues to send letters to encourage NIH to prevail on NIGMS to make additional investments in basic behavioral research, and to encourage other institutes and centers to do more as well.

The report seeks to mollify Congress that plenty is being done to support basic behavioral and social science research. NIGMS has increased its support with two program announcements and an interdisciplinary training program. Many institutes and centers, including the National Institute on Drug Abuse, National Institute of Mental Health, and National Cancer Institute, have active programs of basic research. The report cites NIH estimates that of the \$3 billion going to behavioral and social sciences research, approximately \$1 billion is considered to constitute basic research.

So— is NIH doing enough? We in the Science Policy Office think this is a good context for the maxim, “What you see depends on where you look.” Yes,

NIH is supporting a lot of basic research, but some types of basic behavioral research do not have stable homes at NIH. There is a double standard when it comes to research that is not done in a disease context or within a disease population. Basic research on group behavior is not automatically assumed to be relevant to health, e.g. the spread of influenza, whereas basic cell biology research is. Social psychologists have seen some traditional funding sources dry up. Scientists who do research on language origin and acquisition, especially with bird models, may have a hard time getting support at the National Institute for Deafness and Other Communication Disorders. Scientists who study basic risk and decisionmaking have had little support from NIH. As NIH budget growth has slowed, and the success rates at most institutes have fallen, it is no wonder that some researchers feel discouraged. The NIH report implies

that times are tough for lots of sciences, not only for the behavioral and social sciences.

So— is this all just a budget issue? We think not. Unlike NIH, we at APA are not ready to declare victory. The behavioral and social sciences have come a long way at NIH, but as some institutes change priorities, and some institutes who ought to change priorities don't, there are still lots of areas in which advocacy is needed so that the playing field is level for behavioral and social science. We don't believe NIH is supporting enough basic behavioral research, or enough translational and applied research, and will continue to make our case to sympathetic members of Congress and the NIH leadership.

Please let us know your comments on the NIH report and its support of basic behavioral and social science research. Drop me a line at pkobor@apa.org. ■

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Attention Graduate Students: NIH Research Festival Wants You

The National Institutes of Health is actively recruiting candidates to participate in the upcoming National Graduate Student Research Festival, to be held October 12th, 2006 in Bethesda, Maryland. We are writing to request your assistance in identifying candidates for this exciting event. To be eligible, students must be enrolled in a PhD program in the U.S. and on schedule to complete their PhD degree by October, 2007. We will be selecting up to 250 students to spend two days talking about their research through poster sessions, meeting other students from around the U.S., learning about the research being done at NIH, and exploring postdoctoral training opportunities on the NIH campuses.

The **deadline for application is June 1** and the online application can be found at <http://www.training.nih.gov>.

Psychologists Named to National Academy of Sciences and American Academy of Arts and Sciences

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The National Academy of Sciences (NAS) and American Academy of Arts and Sciences (AAAS) recently announced the newly elected members including several prominent psychologists. Both societies focus on conducting research to make substantial societal contributions. APA would like to recognize and congratulate the psychologists who were elected this spring.

The National Academy of Sciences is an honorary society composed of scientists and engineers who are dedicated to the advancement of science and technology. NAS was established to serve as an official advisor to the federal government on science and technological issues. This year, 72 new members and 18 foreign associates were elected into NAS, including psychologist **Rochel Gelman** of Rutgers, and vision scientist **Edward Adelson**, Massachusetts Institute of Technology. Additional information may be found at: <http://www.nasonline.org>.

The American Academy of Arts and Sciences, an international academic society, was founded to provide leaders from varied disciplines the opportunity to conduct projects designed to address societal problems and advance the public good. This year, AAAS elected 175 new Fellows and 20 new Foreign Honorary Members. The psychologists elected to the 2006 AAAS Fellowship class include: **Richard N. Aslin** of University of Rochester, **Randolph Blake** of Vanderbilt University, **William Tallant Greenough** of University of Illinois, Urbana-Champaign, **Reid Hastie** of University of Chicago, **E. Tory Higgins** of Columbia University, **Rachel Keen** of University of Massachusetts, **Joseph E. LeDoux** of New York University, and **Nora S. Newcombe** of Temple University. Additional information may be found at <http://www.amacad.org>. ■

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Zerhouni noted that more applications are coming in from individual investigators (up from 1.2 to 1.5 applications per investigator in 2005) so that if success rate is judged as a percent of applications the numbers can look harrowing but if calculated as success rate per applicant the picture gets better. Illustrating that point, Zerhouni said success rates in 2005 were 22.3% per application but 27.6% per applicant. So far for 2006 the numbers are roughly 19.8% for applications and 25% for applicants.

Zerhouni sounded a positive note for 2007 indicating that with the end of the 2003 surge, NIH should be funding 3% more grants even with a flat budget. Further, Council member Jeanne Brooks-Gunn noted that the snapshot approach may discourage newer investigators because it fails to take into account the enhanced success rates achieved as proposals are modified and improved across rounds of review. Zerhouni agreed and discussed a number of mechanisms, including the Pathway to Independence Program to help nurture the careers of new investigators. Zerhouni's presentation is mounted here:

http://grants.nih.gov/grants/new_investigators/pathway_independence.htm ■

Early Researcher Awards

The APA Science Student Council is proud to announce its annual competition for early (i.e., pre-doctoral) researchers. **The purpose of the program is to recognize outstanding student researchers who are currently early in their graduate training.** We are unable to accept submissions from advanced graduate students for research completed earlier in their graduate training.

In 2006, two awards will be granted: a \$1,000 award for basic science, and a \$1,000 award for applied science.

This year's deadline is September 1, 2006. More information, including application forms and instructions, can be found on the web at www.apa.org/science/early_award.html.

John Anderson selected for first A.H. Heineken Prize for Cognitive Science

by Suzanne Wandersman

John R. Anderson, Carnegie Mellon University, is the first recipient of the A.H. Heineken Prize for Cognitive Science from the Royal Netherlands Academy of Arts and Sciences. He will receive a \$150,000 prize.

Anderson was selected to receive this prize for his ground-breaking theory of human cognition. His computational theory of human cognition, known as Adaptive Control of Thought (ACT), defines a number of elementary cognitive functions, such as compare, choose, and do. These functions are part of more complex, cooperative modules, including one that responds to visual information as well as memory modules for declarative and procedural information. His work has influenced many different fields of research, from neurocognition to decision making. His theory has been applied to ergonomics and computer-assisted learning.

Anderson received his B.A. from the University of British Columbia in 1968 and obtained his doctorate at Stanford University in 1972. After brief appointments at Yale University and the University of Michigan,

Anderson was appointed Professor of Psychology at Carnegie Mellon University in 1978. In 1983 he accepted a second appointment as Professor of Computer Science. Since 2002 he has held the prestigious Richard King Mellon Chair of Psychology and Computer Science.

Anderson's many honors include receiving the APA Early Career Award in 1978, the APA Distinguished Scientific Contribution Award in 1994, and the David E. Rumelhart Prize in 2004. In 1999 he was elected Fellow of the American Academy of Arts and Sciences and, in the same year, he also became a member of the National Academy of Sciences, acting as chair of its Psychology Section since 2001.

The A.H. Heineken Prize for Cognitive Science is the first major international prize to be awarded for achievements in this relatively new, transdisciplinary field of research that explores the enabling conditions for intelligent behaviour. Ms C.L. de Carvalho-Heineken, who succeeded her father Alfred Heineken on the board of the Alfred Heineken Fondsen Foundation



John R. Anderson

after his death in 2002, agreed to establish this sixth Heineken Prize in part because of her father's lifelong fascination with the workings of the human mind.

There are six Heineken Prizes for science, scholarship and art that are presented every other year during a special session of the Royal Netherlands Academy of Arts and Sciences. This year the presentation will take place on September 28 in Amsterdam. ■



A Scientist's Guide to the APA Convention

The Science Directorate is currently preparing a listing of science-focused programs for the 114th APA Convention which is being held in New Orleans, LA from August 10-13, 2006.

Science Directorate sponsored programs as well as sessions sponsored by APA Divisions will be highlighted. This web-based guide will be available online on the Science Directorate's webpage in late June. Copies will also be available for distribution during the convention at the Science Directorate Booth.

This guide is being developed to highlight and promote science-focused convention programming. Convention programs include symposia, paper and poster sessions, invited addresses, discussions, and workshops.

Funding Outlook for NCI: News from the Experts

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In Fiscal Year 2006, the National Institutes of Health received its smallest budget increase since the mid-1960s—less than one percent—and actually saw its budget cut after a 1% across-the-board cut was applied. How will that affect research funding and programs at the institutes that fund behavioral research? Is there any good news amidst the bad? APA's Science Policy Office put the following questions to several institute officials and program officers, and will publish their responses in the next few issues of *Psychological Science Agenda (PSA)*.

Thanks to Paige Green McDonald, Acting Chief, Basic and Biobehavioral Research branch, Behavioral Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute, for sharing her views with *PSA* readers.

How are your programs being affected by the very lean budget in Fiscal Year 2006?

Despite the reduced budget in FY2006, the National Cancer Institute remains committed to advancing basic and applied research in the behavioral sciences that independently or in combination with biomedical approaches reduces cancer risk, incidence, morbidity, and mortality across the lifespan and the cancer control continuum. Most of the institute's behavioral science research is supported through the Behavioral Research Program (BRP) and the Office of Cancer Survivorship (OCS) within the Division of Cancer Control and Population Sciences (DCCPS). The BRP initiates, supports, and evaluates a comprehensive program of behavioral research ranging from basic behavioral and biobehavioral research to research on the development, testing, and dissemination of disease prevention and health promotion interventions in areas such as tobacco use, screening, health communication, dietary behavior, and sun protection. The OCS conducts and supports research that both examines

and addresses the long- and short-term physical, psychological, social, and economic effects of cancer and its treatment among pediatric and adult survivors of cancer and their families.

So, how are we able to maintain such programs during a time of reduced budgets? We continue to garner support for psychological and behavioral science through collaboration, coordination, and leveraging existing resources. Indeed, the FY06 paylines for research program grants such as R01s and R21s are substantially lower than those seen in recent years; however, the institute has increased support for small research grants (i.e., R03s) and for new investigators.

Has the number of grant applications to your institute been affected by the budget?

Overall, the number of applications submitted to the institute continues to increase. We have not seen an appreciable change in the number of behavioral science applications to NCI.

Are there new areas of research emphasis at your institute for psychologists?

The breadth of the behavioral, psychological, and other social sciences research conducted and supported by NCI is remarkable. Current areas of emphasis include the following:

- Behavior change
- Biobehavioral mechanisms
- Cancer screening
- Cancer survivorship
- Communication
- Coping with cancer
- Decision making
- Health behavior (sun exposure, diet, and physical activity)
- Health disparities
- Risk perception
- Smoking prevention and cessation
- Theory, measurements, and methods

I would encourage psychologists

interested in conducting cancer control research to become familiar with the scientific priorities of the division. The best way initially to do so is to become familiar with the DCCPS Web site (see <http://dccps.nci.nih.gov/index.html>). You will find information about programmatic areas within the BRP (<http://dccps.nci.nih.gov/brp/>) and the OCS (<http://dccps.nci.nih.gov/ocs/>). The Web page on funding opportunities (<http://dccps.nci.nih.gov/funding.html>) lists program announcements (PAs) and request for applications (RFAs) that DCCPS leads or participates in as a scientific partner.

Our division has recently published two PAs (Decision Making in Cancer: Single-Event Decisions, <http://grants.nih.gov/grants/guide/pa-files/PA-05-017.html>; and Decision Making in Health: Behavior Maintenance, <http://grants.nih.gov/grants/guide/pa-files/PA-05-016.html>) to stimulate research on human decision-making processes and to bridge the gap between basic research in judgment and decision making and applied cancer control research. Our emphasis on decision making cuts across all programmatic areas within BRP and OCS. For example, we are interested in studies of decision making about cancer screening when evidence and/or guidelines are uncertain or conflicting, such as genetic testing, multiple screening tests, appropriate age to start and stop screening (e.g., mammography), frequency of screening, and prostate cancer screening. An additional area of emphasis in cancer screening is the development and testing of intervention strategies to modify personal, social, lifestyle, and institutional- and community-level factors known to limit or contribute to cancer screening use.

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We seek to evaluate and promote healthy lifestyles (e.g., smoking cessation, physical activity, dietary changes, use of sunscreen, and reduction in alcohol consumption) for cancer prevention and control as well as enhanced survivorship after a cancer diagnosis. Related to this effort is our interest in energetics and energy balance (i.e., the relationship between diet, physical activity, and obesity) as demonstrated by our recent investment in the Transdisciplinary Research on Energetics and Cancer (TREC) Centers (<http://dccps.nci.nih.gov/trec/>).

In the area of health communication and informatics, opportunities exist for psychologists to utilize the Health Information National Trend Survey (HINTS, <http://cancercontrol.cancer.gov/hints/>). HINTS collects nationally representative data about the American public's use of cancer-related information. The survey provides updates on changing patterns, needs, and information opportunities in health, identifies changing communications trends and practices, assesses cancer information access and usage, provides information about how cancer risks are perceived, and offers a test bed to researchers to test new theories in health communication. eHealth is an emerging area and we are interested in the theoretical and methodological aspects of conducting such research.

The NCI has been working closely with the Office of Behavioral and Social Sciences Research (<http://obssr.od.nih.gov/>) to push forward a concept of "populomics" to take its place alongside "genomics" and "proteomics" within the nation's emerging National Health Information Infrastructure. By introducing the term *populomics*, we argue that it is crucial for national planning and team science to include common data elements from the behavioral sciences into national assessments of population health. Behavioral measures are needed in the health care environment, in which the Institute of Medicine is urging reform

to make the system more "patient-centric;" and in public health planning, in which national indices of progress on behavioral measures could guide policy and communication planning.

Opportunities will be made available in the near and foreseeable future to determine how to represent measures for aggregation at a population level. Behavioral scientists with content expertise can participate in nominating constructs for national aggregation; behavioral scientists with psychometric training can participate in proposing and refining measures; and behavioral scientists with epidemiologic, survey administration, or information technology ties can participate in designing the data structures needed for national aggregation.

Opportunities for psychologists abound in the arena of tobacco control research. Theoretical and basic research considering the mechanisms and mediators of behavioral change continues to be an important foundation for evolving translational work. Biobehavioral science concerning the gene-environment interactions leading to understanding of tobacco use, nicotine addiction, and cessation is an exciting arena for psychologist researchers. Further along the translation continuum, the emerging development of new medications continues to provide opportunities for identifying how they work, with whom, and under what circumstances. Psychologists can play a key role in working to increase the efficacy of existing treatments, especially in the area of behavioral interventions and combined behavioral/pharmacologic interventions. An exciting, burgeoning area is that of how policy influences behavior related to tobacco on a population level and how policy interacts with other determinants of tobacco use, such as social network, social support, and biological and behavioral factors. Lastly, psychologists are playing a leading role in cross-disciplinary research, in which they

work collaboratively with scientists from diverse disciplines to address the complex problem of tobacco use and nicotine addiction (see http://dccps.nci.nih.gov/tcrb/research_topic-transdisciplinary.html).

From the survivorship end of the cancer control continuum, areas of emphasis include designing and delivering psychosocial interventions with the potential to improve quality of life, diminish adverse treatment-related symptoms, lengthen survival, and decrease the need for medical care among survivors. Furthermore, psychologists can contribute to our understanding of cancer caregiving in the familial context. We need to know more about the emotional, social, and physical costs and benefits of informal cancer caregiving. Research is also needed to enhance our understanding of survivors' cognitive beliefs about their survivorship status and public perceptions of cancer as a stigma.

Cross-cutting areas of emphasis include the development and evaluation of improved theories of health behavior (http://dccps.nci.nih.gov/brp/health_theory_index.html) and theory-based interventions to promote healthy behavior <http://dccps.nci.nih.gov/hcg/index.html>. For the biologically oriented psychologists, the division continues to cultivate animal and human research related to the influence of biobehavioral factors (e.g., life stress, psychological processes, and health behaviors) on cancer pathogenesis (see <http://www.cancercontrol.cancer.gov/bimiped/>).

Are there training or retraining mechanisms in your institute that psychologists should take more advantage of?

The NCI has two career development awards (K awards) for new investigators committed to careers in the fields of cancer prevention, control, or behavioral and population sciences. The Cancer Prevention, Control, and Population Sciences Career

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Development Award (K07, <http://grants.nih.gov/grants/guide/pa-files/PAR-06-381.html>) allows for specialized didactic study and a mentored research career development experience. The Transition Career Development Award (K22, <http://grants.nih.gov/grants/guide/notice-files/NOT-CA-06-010.html>) supports the transition of mentored postdoctoral fellows into their first independent research positions. For clinical psychologists, the Mentored Patient-Oriented Research Career Development Award (K23, <http://grants.nih.gov/grants/guide/pa-files/PA-05-143.html>) supports the career development of investigators who have made a commitment to focus their research endeavors on patient-oriented research. Through the NCI's Comprehensive Minority Biomedical Branch (CMBB, <http://minorityopportunities.nci.nih.gov/index.html>), additional career development opportunities are available for psychologists who are ethnic and racial minorities, come from socioeconomically disadvantaged backgrounds, or have a disability.

The Cancer Prevention Fellowship Program (<http://www3.cancer.gov/prevention/pob/index.html>) provides training for individuals from the health professions and biomedical sciences to become leaders in cancer prevention and control. Through the program, fellows obtain a master of public health degree, mentored research experiences at NCI or at the U.S. Food and Drug Administration, and professional development/leadership training. DCCPS provides opportunities for fellows to focus on social and behavioral research as part of the mentored research experience.

Psychologists might also want to consider receiving fellowship training through the Cancer Research Training Award (CRTA http://www.ncifcrf.gov/careers/student_programs/internships/CRTA.asp). The CRTA fellowship provides a unique opportunity to work with NCI scientists who are leaders in

behavioral science and cancer control.

What can psychologists do to improve their chances of being funded?

As mentioned above, it is paramount that psychologists become familiar with the research priorities, resources, and opportunities for behavioral and social sciences research at NCI. I briefly described just a few examples of such priorities; more information about our major initiatives can be found at <http://dccps.nci.nih.gov/bb/index.html>. I recommend taking the time to survey what is currently funded in the behavioral and social sciences. This can be done by exploring our portfolio (<http://cancercontrol.cancer.gov/grants/query.asp>) and the Cancer Research Portfolio (<http://researchportfolio.cancer.gov/>). I encourage psychologists to review the NCI Strategic Plan (<http://strategicplan.nci.nih.gov/>). Once you have done your background work, it is most important to contact program staff (see <http://cancercontrol.cancer.gov/od/staff.html>) before submitting an application. Among other things, we can confirm that your research topic fits within a programmatic priority and provide input as to what mechanisms might be most appropriate. Our Web site also offers a useful systematic guide on grant proposal development http://cancercontrol.cancer.gov/grant_help/index.html.

It is important to become familiar with grant funding mechanisms, understand submission procedures, be aware of the NIH grants timeline, understand the peer review process, develop your idea and write a strong grant application. ■

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Congressional Briefings Focus on Science Education

by Clare Porac

The degree to which the United States can remain competitive in the international community of scientists and engineers has been a hot topic of conversation around Washington since the release in late 2005 of the National Academies of Science (NAS) report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Future*. This report formed the basis for President Bush's *American Competitiveness Initiative* announced in his 2006 State of the Union address. Two recent congressional briefings covered topics related to the quality of science education from pre-school level through to university courses; several of the topics discussed at these briefings are of interest to scientific psychologists.

On April 26, 2006 the Congressional Biomedical Research Caucus held a briefing entitled, *Teaching Science: How We Fail and How We Could Succeed*. The guest speaker was Dr. Bruce Alberts from the University of California at San Francisco and former president of the NAS. Alberts was introduced by House Member Rush Holt (D-NJ).

Representative Holt is a physicist who has recently introduced two bills aimed at increasing both the number of university graduates with science degrees and the number of individuals who teach in science and technology areas. Alberts' remarks centered on the theme that efforts to maintain and increase the infrastructure of science must also include efforts to improve the quality of science education and the quality of science teachers in the United States. He was critical of the rote learning of scientific facts and terms that is the dominant approach to current education in the sciences from pre-school to the university years. He argued that this method of teaching science guarantees that most students are turned off by science courses by the

time that they reach the high school level. Alberts promoted a problem-based method to the teaching of science that is designed to take into account findings from high quality educational research and research into the cognitive psychology of learning. He argued for increased funding and attention to these types of research efforts.



A similar theme was discussed at a congressional briefing held on May 2, 2006 entitled *Redesigning High School Science Curriculum to Meet the Demands of Global Competition*. This briefing focused on the recent grant award of \$1.8 million dollars from the National Science Foundation (NSF) to the College Board to fund the redesign of Advanced Placement (AP) high school courses in biology, chemistry, physics and environmental science. The principal investigator on the grant is James Pellegrino, distinguished professor of psychology and education at the University of Illinois at Chicago. Pellegrino was one of the panel members who spoke at the briefing along with David Ely, an award-winning

biology teacher from Champlain Valley Union High School in Hinesburg, VT, Shirley Malcom, Head of the Directorate for Education and Human Resources Programs at the American Association for the Advancement of Science (AAAS) and Judith Wurtzel, Senior Fellow, Education and Society Program at The Aspen Institute. The panel discussion was moderated by Jay Mathews, education reporter and columnist for *The Washington Post*.

While each brought their own perspective on the AP program, the panelists were in agreement that the focus of the AP science curriculum should be shifted from covering an exhaustive list of content topics to conveying the essence of "scientific thinking." "AP teachers of science have to get over the view that they must get through the entire curriculum" was a comment repeated by several of the panelists. Rather teachers should cover fewer topics with an in-depth, problem-solving approach. Currently AP courses are modeled after first-year university introductory science courses that are most often taught in large class formats with grades based on multiple-choice exams emphasizing mastery of facts and terminology. The speakers acknowledged that the format of university-level courses will be highly resistant to reform. However, they were hopeful that future AP graduates, who will enter universities after experiencing a redesigned AP curriculum, will demand changes in university science instruction that will fuel eventual reform at higher educational levels. The panelists also commented that the reform of AP instruction will require additional professional development programs for current high school teachers so that they are given the opportunity to develop the types of teaching skills needed to convey the essence and excitement of a scientific approach to problem-solving.

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Call for Nominations to the APA Science Student Council

The Science Directorate of the American Psychological Association (APA) requests your help in making nominations to the APA Science Student Council (APASSC). Formed in 1993, the APASSC is a diverse group of science-oriented psychology graduate students who serve as an advisory group to the APA Science Directorate. The Council represents the interests of science-oriented students by providing valuable advice to the Directorate on how it can best serve the science student population. The Council has been actively involved in a number of projects, including organizing student programs for the APA Convention and making recommendations on the Directorate's student programs. The Council reports to the Board of Scientific Affairs (BSA) and works cooperatively with the American Psychological Association of Graduate Students (APAGS).

The Directorate is seeking nominations of graduate students, **currently in their first or second year**, to serve a two and a half year term (fall 2006, and the 2007 and 2008 calendar years), during which time they must be actively engaged in their programs. Council members are required to attend two weekend meetings per year during their term in Washington, DC, at APA's expense. The first meeting of this term will take place in November of 2006. In addition, council members are expected to remain available during an unofficial third (non-meeting) year to help advise new incoming members.

One (1) position is currently available on the Council, in the following area of research:

Psychological Methodology

Sample areas of interest: *Applied Experimental Psychology/Methodology (Quantitative or Qualitative)/Statistics*

All nominations must be **received (not postmarked) by June 19, 2006**, and must include the following materials:

1. A letter of recommendation (not to exceed 500 words) from the student's advisor, co-signed by the Department Chair, endorsing the nomination.
2. An essay written by the student about why she/he wants to be on the Council and how she/he could contribute as a Council member (not to exceed 500 words).
3. A description written by the student about his/her research in psychology that demonstrates commitment to psychological science (not to exceed 500 words).
4. An abbreviated curriculum vitae (not to exceed two pages).

The new Psychological Methodology representative to the APASSC will be selected by **July 16, 2006**.

Please direct questions and nomination materials to:

Amy Test
 APA Science Directorate
 750 First Street, NE
 Washington, DC 20002-4242

Email: atest@apa.org
 Phone: (202) 336-5941

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The increased attention to the quality of education in the sciences provides a number of opportunities for psychologists as scientists and educators. These briefings have highlighted the increased need for quality research into educational methodologies and into the psychology of learning and learning styles. Many psychologists are already involved in

research efforts aimed at assessing and improving the teaching of psychology at the high school and undergraduate levels.

AP psychology courses are the fastest growing segment of the current AP course offerings so what is learned from this reform effort be applicable to the AP psychology curriculum as well.

Psychological scientists and their students should remain alert for future research funding and fellowship/scholarship opportunities that will flow from the overall government emphasis on keeping the United States competitive in science, engineering and technology. Psychological science, in a number of its forms, fits into this niche quite well. ■

Congratulations to the 2006 Student Travel Award Winners!!

The Science Directorate sponsors an annual competition for graduate student travel awards, in order to help psychology graduate students travel to the annual APA Convention to present their research. Following is a list of the 2006 recipients, who will each receive \$300 to defray their expenses in New Orleans. Congratulations to all of our Student Travel Award winners!

Sue Adams, University of Massachusetts, Boston
Lynette Adams, Southern Illinois University, Carbondale
Allison Applebaum, Boston University
Rubab Arim, University of British Columbia
Karyn Audet, Simon Fraser University
Nicole Avena, Princeton University
Brian Ayotte, West Virginia University
Jon Peter Baello, California State University, Fullerton
Jon Craig Barch, University of Iowa
Marcella Boynton, University of Connecticut
Guler Boyraz, The University of Memphis
Carolyn Brodnick, University of Kentucky
David Bucur, Purdue University
Kuan-yi Chen, University of Texas, Austin
Wai-Ying Chow, Arizona State University
Cody Christopherson, University of Notre Dame
Keith Ciani, University of Missouri, Columbia
Maria Constantinidou, Nova Southeastern University
Maria Cruza-Guet, Lehigh University
Kristen Dams-O'Connor, University of Albany
Cirleen DeBlaere, University of Florida
Kristen Demertzis, University of California, Los Angeles
Nathan Doty, University of Miami
Vanessa Downing, University of Maryland
Amy Drapalski, George Mason University
Jeanne Duax, Case Western Reserve University
Nicole Else-Quest, University of Wisconsin, Madison
Marina Epstein, University of Michigan
Tiffanie Fennell, Texas Tech University
Amanda Ferrier, University of Albany
Peter Forkner, George Mason University
Ravi Gatha, Boston College
Ashley Gibb, Indiana University
Seth Gillihan, University of Pennsylvania
Amalia Guerrero, Alliant International University
Rachel Jacobs, Northwestern University Feinberg
Jessica Johnson, East Carolina University
Shiloh Jordan, University of Missouri, Columbia
Cynthia Khan, Kent State University
Paul Kim, University of Notre Dame
Jenny Klein, University of Central Florida
Brandon Korman, Nova Southeastern University
Michael Lau, University of Notre Dame
Susan Lazar, Duquesne University
Seongjik Lee, University of Kentucky
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Stacie Leffard, Duquesne University
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Kelly Liao, Iowa State University

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Luci Martin, University of North Texas
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Sarah Miller, University of Alabama
David Miller, University of Oregon
Judith Misbach, University of Calgary
Demietrice Moore, Purdue University
Katherine Morasch, Virginia Tech
Cynthia Najdowski, University of Illinois, Chicago
Ashley Newton, University of Denver
Soorim Noh, University of Illinois, Urbana Champaign
Nilda Medina, University of Puerto Rico, Rio Piedras
Lori Phelps, University of Wisconsin, Milwaukee
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Rachel Swopes, Pittsburg State University
David Tager, University of Missouri, Columbia
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Ryan Thibodeau, Syracuse University
Mindi Thompson, University of Akron
Daphny Tobias, Our Lady of the Lake University
Katalin Toth, University of Nevada, Reno
Giac-Thao Tran, University of Minnesota
Irina Tzoneva, Simon Fraser University
Jessica VanVieet, Penn State University at Harrisburg
Emily Wakeman, The University of Alabama
Mei-Chuan Wang, The University of Memphis
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PSYCHOLOGICAL SCIENCE AGENDA

Psychological Science Agenda is published monthly by APA's Science Directorate. Dedicated to promoting and serving scientific psychology, *Psychological Science Agenda* provides news about national scientific policy developments, examines policy issues affecting and affected by the behavioral research community, and highlights the advocacy efforts of the Science Directorate on behalf of research and academic psychologists. *Psychological Science Agenda* also features news of APA's governance and program initiatives relating to scientific and academic psychology, and provides valuable, timely information about funding opportunities for research psychologists.

Psychological Science Agenda is distributed free to 30,000 psychologists, members of Congress and their staffs, key officials in federal agencies that fund behavioral research and use its findings, institutional libraries, and science writers in the national media.

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