



OBSERVER

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E. Gibson, A. Newell Receive National Medal of Science

Ten Behavioral Scientists Have Received Honor

APS fellows received two of the eight National Medal of Science awards given by President George Bush on June 23.

Eleanor J. Gibson and Allen Newell, both APS William James

Fellows, received the nation's highest scientific award, along with six other distinguished scientists in astro-geology, quantum electronics, genetic engineering, organic chemistry and other fields.

President Bush presented the eight awards at a White House Rose Garden ceremony attended by Gibson and her adult children, grandchildren, and sister. Newell's son Paul accepted the award for his ailing father, who would die of cancer a few weeks later, on July 19, in Pittsburgh. (See related story on page 27.)



Eleanor Gibson receives National Medal of Science from President George Bush while White House Science Advisory D. Allan Bromley congratulates her in a White House Rose Garden ceremony on June 23.

Photo courtesy of NSF; © 1992 Carol Clayton

◆ Happy Birthday, APS!

APS Became 4 Years Old on August 12, 1992!

◆ Heard Around the World:

25th International Congress *Daily Newspaper* (July 21, 1992) says APS may be "the fastest growing scientific society in the world."

INSIDE

J.M. Cattell Award	3
Animal Research Law	4
NICHD Behavior Research	5
Call for Nominations	6
NSF Rescissions	7
Human Capital Initiative	9

Departments

Presidential Column - Gery d'Ydewalle	2
How To - Write Articles for Journals	12
Member Profile - Norman Krasnegor	17
Members in the News	25
People	26
The Student Notebook	28
Organizational Profile - Behavioral Neuroscience	30
Letters	31
Announcements	33
Employment Bulletin	35

Newell

Newell, who was a professor of psychology and computer sciences at Carnegie Mellon University, was one of the founders of both artificial intelligence and cognitive science.

SEE MEDAL ON PAGE 14

APS Bylaws Revisited

Members to Vote on Proposed Changes

In August 1988, meeting on Bonnie Strickland's porch, the founders of the American Psychological Society drafted the Society's first bylaws, giving shape to their vision for the new organization's purposes and structure. Even the most optimistic among those on that porch four years ago probably did not imagine APS would grow so rapidly, and become so strong and productive. But by specifically including a provision in the original bylaws for a review of the bylaws document within five years, that group was ensuring that APS would continue its evolution as a growing, dynamic organization.

Now, APS's membership is well over 14,000. Our program is

SEE BYLAWS ON PAGE 16

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The APS Observer

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International Congress

Gery d'Ydewalle

Congress Co-President and Secretary-General IUPsyS



XXVth International Congress of Psychology Brussels, July 19-24, 1992

The International Congress of Psychology in Brussels attracted many thousands of participants from more than 70 countries. There were more than 700 participants from the United States. It was the first time that so many psychologists from East Europe tried to attend the meeting. While the political situation of the former socialist countries was no longer an obstacle to attending, those participants faced major financial problems.

Brussels Was Successful

As a scientific meeting, the Congress could be considered a landmark in the successful series of International Congresses. The Brussels success could be attributed to careful preparation of the scientific program; the preparations took more than four years.

As the International Congress of Psychology (under the auspices of the International Union of Psychological Science [IUPsyS]), alternates with the International Congress of Applied Psychology (organized on behalf of the International Association of Applied Psychology, IAAP) to organize the meeting, it was the intention of the Congress organizers to develop a strong scientific program on basic psychological processes.

To achieve this outstanding basic science program, we selected and invited eminent keynote speakers and speakers on state-of-the-art topics as well as symposium conveners who are well known for their dedication to basic science. We collected information on the current status of psychological research by soliciting help from the 49 scientific member organizations of IUPsyS.

Science at the Forefront

Due in part to the strong representation of science on the developing program, many outstanding scholars were willing to submit abstracts for oral or poster presentations. And, the submitted part of the Congress was of excellent quality.

The Brussels Congress set a record for poster presentations (more than 2,000 were presented), and they were grouped in interactive sessions allowing open discussions. A total of more than 4,000 abstracts were accepted for oral or poster presentation, and they all were published in a special issue of the *International Journal of Psychology*.

A Helping Hand

The meeting was not without its logistical surprises. On the very first day of the Congress, a large number of participants from East Europe arrived unexpectedly by train, but a gracious welcome by the Congress organizers allowed hundreds to receive a registration fee waiver and free, or at least cheap, accommodation. The same was provided to many from countries in the Developing World, too.

Read All About It

The daily Congress Newspaper was particularly well received by attendees. The newspaper's five issues included discussions and interviews with leading researchers on contemporary issues. It will be a challenge for the organizers of the next International Congress (Montreal, 1996) to meet the standards of the Brussels Congress.

APS Announces New Award In Applied Psychology

James McKeen Cattell Award

In recognition of the outstanding contributions made by scientists working in the area of applied psychological research, a new APS award has been established, the James McKeen Cattell Fellow. The first recipients of this honor will be recognized at the 1993 APS Annual Convention in Chicago.

Early in 1992 a special committee chaired by Daniel Ilgen, was formed for the purpose of establishing criteria for the James McKeen Cattell Fellow. (See call for nominations on this page.) Nominees will be evaluated on the societal significance of their research.

Consistent with the mission of APS, the committee believes that the research should address a critical problem in

society at large. In addition, nominees will be evaluated on the quality of their research, and the influence of their research on the work of others in the field. The recipient's work should have an enduring and significant impact in his/her field. One or two APS members will be chosen to receive this honor each year.

The Society also recognizes excellence in the discipline with APS's William James Fellow award, which honors individuals who are "internationally recognized for their outstanding contributions to psychology." This award, given to two recipients each year, honors careers of significant intellectual contributions to the science of psychology.

Nominations Sought for APS James McKeen Cattell Fellow Award

The James McKeen Cattell Fellow of APS was established for recognizing those who have made distinguished contributions to applied research in psychology. It is anticipated that one or two persons will be selected for the award each year. Nominees will be evaluated with respect to the significance of the applied problem they have addressed, the quality of their work, and the impact of their work on society and the research of others.

To submit a nomination, three documents are required:

- (1) a letter of nomination, specifying the nominee's scientific accomplishments and the impact of his or her work;
- (2) two supporting letters from individuals familiar with the work of the nominee (stating the work's significance to society, and its impact on others); and
- (3) a complete and up-to-date curriculum vitae.

All information will be evaluated by the 1992-1993 James McKeen Cattell Fellow Committee consisting of Robert Glaser, Daniel Ilgen (chair), Ellen Langer, Ellin Scholnick, and Lee Sechrest. A **December 1, 1992, deadline** has been set for nominations. All information should be sent together in one packet to: Daniel R. Ilgen, Chair, The James McKeen Cattell Fellow Committee, APS, 1010 Vermont Avenue, NW, Suite 1100, Washington, DC 20005-4907.

Further questions can be addressed to Sharon Hantman, APS, Director of Membership (tel.: 202-783-2077, Bitnet: SHANTMAN@BITNIC).

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Animal Research Protection Bill Approved

After four years of work by an alliance of groups representing behavioral and biomedical research, agriculture, education, animal welfare, the American Civil Liberties Union, and federal agencies, researchers who use animals can now breathe a little easier. Congress has finally passed the "The Animal Enterprise Protection Act of 1992," commonly referred to as the "break-in" bill. Congress's action was in response to continued acts of vandalism and thefts at animal research and farm facilities by animal rights extremists.

The initial bill was sponsored by Rep. Charlie Stenholm (D-TX), and it passed out of the Agriculture Committee with 263 cosponsors. After a compromise with a Judiciary Committee version, it passed the House on August 4. Three days later, the Senate companion bill (S.544), sponsored by Senator Howell Heflin (D-AL), concurred with the House bill and essentially merged its bill into the House version and passed it.

APS has been working in support of the

legislation since we opened our Washington office (see March, 1990, *Observer*, p. 23). Soon after the August passage, APS Executive Director Alan Kraut sent a letter to President Bush urging him to sign the measure. As the *Observer* was going to press, the President did sign the bill into law.

Highlights

Among other things, the bill:

- ▼ Amends Title 18 of the U.S. Criminal Code by adding a new section covering "Animal Enterprise Terrorism."
- ▼ Makes it a federal offense to commit physical disruption to an animal enterprise on an interstate or international basis and that results in economic damages exceeding \$10,000.
- ▼ Covers offenses such as "stealing, damaging or causing the loss of any property used by an animal enterprise."

▼ Defines an animal enterprise as a commercial or academic enterprise that uses animals for food or fiber production, agriculture, research or testing; a zoo, aquarium, circus, rodeo or lawful competitive animal event, or any fair or similar event intended to advance agriculture arts and sciences.

▼ Provides for penalties of up to a year in jail for damages exceeding \$10,000 and has stricter penalties for situations in which anyone is injured or killed during an attack on an animal enterprise.

▼ Requires anyone convicted under the bill to pay for damages as well as the cost of repeating the damaged experimental research.

The legislation is particularly welcomed by psychology researchers and others whose laboratories have been the targets of destruction and has cost millions of dollars and valuable years of research. With the severity and frequency of attacks increasing, many researchers have been living in fear for themselves as well as their families. By making these incidents federal crimes, prosecution efforts across state lines will be better coordinated and more successful. ♦

Psychologists love to experiment.

XXV International Congress of Psychology (Brussels 1992)

... is the winning bumper sticker of the 25th International Congress of Psychology. Look for it on autos world-wide. The waggish group responsible for submitting the entry remains anonymous, but here's a clue: its initials are A-P-S.

Behavioral Research at NICHD Gets Boost from Congress

WASHINGTON, DC—The House of Representatives has made behavioral development a priority for the National Institute of Child Health and Human Development (NICHD). Two initiatives—one on normative research for ethnic minorities, and one on middle childhood development—were included in the House Appropriations Committee report on NICHD for fiscal year (FY) 1993. Both initiatives were originated by APS in conjunction with the Society for Research in Child Development (SRCD).

Normative Research

APS first raised the need for normative research on ethnic minorities in 1990, calling for NICHD-funded research in this area to offset the fact that most developmental research on minorities focuses on high-risk groups affected by poverty, lack of education, lack of health care, and other conditions. Normative research is necessary to dispel the distorted images that result from this unbalanced or incomplete research data base, and it is essential in establishing a basis for comparison when evaluating the effectiveness of early educational interventions and other childhood programs.

While NICHD clearly understood the need for normative research on ethnic minorities, it took congressional directives to move this issue onto NICHD's priority agenda. We worked with Congress—in particular, Rep. Louis Stokes (D-OH), a member of the House Appropriations Subcommittee that oversees NICHD and Senator Tom Harkin (D-IA), chair of the Senate Appropriations counterpart—to develop these directives. In response, NICHD has issued a Request for Applications (RFA) in the area of normative behavioral research of ethnic minorities and is providing \$800,000 in FY 93. The National Institute of Mental Health (NIMH) will be providing \$300,000.

Continuing Congressional Interest

We have continued to work with Rep. Stokes and Chairman Harkin to make sure that NICHD's recent RFA is not a one-time project, but instead is a first step in a continuing program of support for normative research on behavioral development. The House Appropriations Committee has reaffirmed its interest in this issue in its FY 93 Report, saying:

The Committee understands that NICHD has released a request for applications for an initiative encouraged in last year's [appropriations] report in the area of normative development in ethnic minorities. The Committee encourages NICHD in collaboration with NIMH to further expand research in this area and would like to be kept informed of this project.

Middle Childhood Development

The House Appropriations Committee also encouraged NICHD to sponsor research on issues of middle childhood development. Similar to the history of the normative research RFA, APS and SRCD alerted the Committee to the need for this research. In his testimony to the House and Senate Appropriations Committees,

APS Executive Director Alan Kraut outlined the need for research on development during the middle childhood years:

This initiative stems from the belief that many problems of adolescence and young adulthood—problems of school dropouts, unwanted pregnancies, gangs, alcohol and drug abuse, and AIDS, among others—have their roots in the middle childhood years, the ages of 5-11. We need to know about the development of a whole series of middle childhood skills dealing with decision making, resolving conflicts, fighting off peer pressure, building self confidence, and many others including traditional academic functioning, if we are to legitimately address these problems. But the middle childhood years, the ages of 5-11, are just the years that are least understood by our nation's child development researchers.

Begin Planning

These concerns were echoed by the House, which has responded, saying in the FY 93 Appropriations report that:

The Committee also notes that problems of school dropouts, unwanted pregnancies, gangs, alcohol, drug abuse and AIDS have their roots in the middle childhood years, ages 5 to 11. The Committee encourages NICHD in collaboration with NIMH to consider development of a new general behavioral science initiative in the area of middle childhood development. The Committee would like NICHD to report progress in this area during the FY 1994 hearings.

Similar provisions on the normative research RFA and the middle childhood development initiative are being pursued in the Senate, which has not yet passed its version of NICHD's FY 93 Appropriations. **S.B.**

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Speaking Truth to Power: An NSF Grantee Responds

A few months ago, during a political battle in which the Congress and the Bush Administration were accusing each other of pork barrel spending, a number of behavioral and social science research grants were singled out by the Senate Appropriations Committee as examples of wasteful Executive Branch projects. (See July, 1992, *Observer*.) The Committee threatened to discontinue funding for the

projects, most of which were supported by the National Science Foundation (NSF) and were underway or in some cases nearing completion.

Following is a letter by Paula Niedenthal, an APS member from Johns Hopkins University whose grant was among those targeted. Niedenthal sent the letter to Senator Barbara Mikulski (D-MD), chair of the Appropriations Subcom-

mittee that oversees the NSF. Writing as a constituent and as a scientist, Niedenthal makes a powerful case on behalf of psychological research. She talks about the field of experimental social psychology generally as well as her own research, describing some of the methods used and how knowledge is developed. She also gives examples of how the knowledge produced by the field might relate to national problems and policy issues. We offer this letter as a model of how psychology researchers should be communicating with their Senators and Representatives.

Johns Hopkins UNIVERSITY

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Senator Barbara Mikulski
320 Hart Senate Office Building
Washington, DC 20510-2003

6. August, 1992

Dear Senator Mikulski:

I am writing in hopes of beginning an ongoing constructive dialogue on research in psychology. I know that you are a strong supporter of scientific research and I have been in touch with the American Psychological Society that has told me of your support of the *Human Capital Initiative*, the document that outlines the contributions that behavioral and social science can make toward addressing some of the major problems currently facing our nation. But I must tell you that my research grant was one of those that was targeted, because of its title, as a grant to be cut in the FY 92 rescissions for the National Science Foundation (NSF). I am currently in the third year of the grant, which is entitled "Affective Bases of Person Perception." As a member of your constituency, a faculty member at Johns Hopkins, and a concerned citizen, I feel strongly that we would both benefit from more extensive communication about my federally sponsored research.

Before I describe the specifics of the research I have been conducting at Hopkins with funds from NSF, let me define the domain of inquiry of experimental social psychology. Social psychology has been defined as the scientific study of the influences of real and imagined others on the behavior of the individual. Behaviors include thoughts, actions, and feelings. So, social psychologists explore how other people who are present in a situation, as well as people we are just thinking about in a situation, influence the actions we engage in, the ways we think about our world and ourselves, and our emotional reactions to events. Historically, research in social psychology has focused on topics such as decision-making, attitudes, and stereotypes, anti-social behavior, prosocial behavior, conformity,

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obedience, and motivation. Investigation of these topics was largely inspired by the events of World War II and many of the most influential social psychologists were German and Eastern European immigrants.

The scientific study of human behavior, thought, and emotion is carried out in the same way as is the study of physical events. That is, social psychologists conduct complex, controlled experiments in which they attempt to manipulate the factors that they think cause the outcomes they are interested in. They use statistics to evaluate their findings, that is, to determine whether the findings are likely to have been due to the factors that they manipulated or are likely to be due to chance alone.

Social psychologists also examine a vast array of important applied issues. For example, researchers in my field are currently studying voting behavior, jury decision-making, political decision-making, social support networks and the coping patterns of AIDS victims, race relations, and behaviors related to the environment such as recycling and water conservation.

In the 1970s new scientific models combining computer science and cognitive psychology were developed that brought social psychology to a new level of theoretical and methodological sophistication. This new field, known as social cognition, is the study of the mental processes that are involved in the acquisition (perception) and internal representation (memory) of information about the self, other people, and social situations. It also involves study of the processes by which memories about the self, events, and relationships influence judgment, impression formation, decision-making, evaluation, and emotion.

The social-cognitive models were powerful, but did not include emotion or motivational processes that might also guide cognition and behavior. Consequently, since my second year of graduate school, I have been investigating the role of emotion in how we **perceive** (actually see) and **think about** ourselves and other people. In my completed work I have shown that perceivers' emotional responses can be quite subtle and nonconscious but nevertheless have predictable effects on how they see and think about other people. My ongoing research addresses the question of **how** is it that emotions influence perception and thought. If we want to prevent an angry person from seeing the hostile aspects of others or forming a negative impression of them we need to know how emotion influences perception and cognition, not just that it does. Investigation of the nonconscious effects of emotion in person perception is critical because it helps scientists develop better methods of preventing or modifying attitudes and stereotypes. As you surely know, it is neither easy nor straightforward to do so, but has enormous implications for important issues such as racism and AIDS.

Although my particular interest in person perception and impression formation (e.g., the evaluation of others, prediction of others' behaviors, stereotyping, and prejudice), the model of emotional memory and emotion processing that I am developing can be used to understand how emotions influence perception of

any external event. For instance, this work should lead us to better understand how a pilot who is afraid will perceive an instrument panel, how an angry driver will perceive a traffic pattern, or how a happy voter will perceive a political candidate.

Let me conclude this letter by pointing to an example of the importance of social science research for society and the uses of research in social psychology in particular. Several months ago Dan Quayle told the American people that a decay in family values had **caused** the riots in L.A. that followed the outcome of the Rodney King trial. William Dannemeyer has attributed such events to the lack of religious training in the public schools. During the Democratic Convention, Bill Clinton said that he thought that problems of the youth in the inner city were due to the lack of a positive vision for the future. It is nice that these politicians, particularly the first two, feel that they can simply divine the answers to massive societal problems. But these are the very issues that social psychologists study empirically. The fact is, there is no empirical support for the global and politically charged proclamations of either Quayle or Dannemeyer. There is actually research that strongly supports Bill Clinton's analysis. Specifically, there is research that examined the "visions" of juvenile delinquents who had committed crimes of varying seriousness and compared the content of the visions to those of youths from similar backgrounds who had not been incarcerated. The worst offenders had very bleak notions of who they could be in the future. Most of them imagined that poverty, crime, and even death were imminent.

Research conducted by social psychologists is vitally important for the development of public policy. Equally important, though, is that politicians base their public comments about human behavior on research rather than ideology or introspection. I would hope that under your guidance, and under that of the next administration, the anti-intellectual attitude of the federal government as a body and the failure to pay attention to the work of the social scientists who they sometimes derogate for purely political reasons will finally come to an end.

Thank you for taking the time to read this letter. Please feel free to contact me with further questions. I am happy to work to educate others on social science research as well as to foster a more productive relationship between the scientific community and the government.

Sincerely,

Paula M. Niedenthal, Ph.D.

NSF Directed to Use Human Capital Initiative

WASHINGTON, DC—The National Science Foundation (NSF) has been directed by the U.S. Senate to incorporate the Human Capital Initiative in planning its behavioral science research agenda. While this is not the first expression of congressional interest in the HCI, the Senate's directive represents a new degree of support for using the national behavioral science research agenda in planning federal research activities.

The Senate directive on the HCI is the direct result of APS discussions with



Senator Barbara Mikulski

Senator Barbara Mikulski (D-MD), chair of the Appropriations Subcommittee overseeing NSF. Mikulski made a point of praising the Human Capital Initiative during her subcommittee's hearings on NSF in May. She also inserted the following language in the FY 93 Appropriations report on NSF:

The Committee is pleased to see that the behavioral and psychological sciences communities have produced a comprehensive vision for research in their disciplines called the Human Capital Initiative. The Foundation will report to the Committee, concurrently with the submission of the fiscal year 1994 [appropriations] request to the Congress, on how it will incorporate the initiative into its programs.

Counterbalance

This comes at a time when NSF research in these areas is caught in the middle of a political battle between Congress and the Administration (see July, 1992, *Observer*). It is APS's position that the HCI was a significant counterbalance to a legislative proposal that would have stopped funding for several behavioral and social science grants at NSF, because the HCI is both an accessible source of information about the contributions of our discipline and a clear measure of our accountability. Systemati-

cally setting priorities and identifying areas of opportunity in psychological and behavioral research are exactly the kinds of effort that are needed to make this research less vulnerable to such attacks in the future.

APS has already been in touch with NSF director Walter Massey to begin discussing how NSF might best respond to the Senate directive. The directive is especially timely, since the Human Capital Initiative is compatible with several current NSF activities that take a longer view of the agency's mission. These activities include the reorganization of the new Social, Behavioral and Economic (SBE) Sciences Directorate, the establishment of a "Special Commission on the Future of the NSF" and the development of a "strategic plan" of sorts that will outline a vision for the agency over the next few years. S.B.

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Estimating Skills: Importance in Scientific Progress and Everyday Life

Implications for Improving Education

Quick: What are the populations of Canada and Indonesia? Ok, if you can't answer that, then at least tell which is likely to be the bigger population.

If you're like most Americans, your guesses are probably not only wildly inaccurate but also just the reverse of the correct figures.

Getting that question wrong may not be a big deal, but being able to make good quantitative estimations in general is an important skill, argues Robert S. Siegler, both in our understanding of the world and in our ability to function efficiently in everyday living. Citing an example of the former, Siegler pointed out that one factor impeding acceptance of Darwin's theory of evolution was the inability of his predecessors and peers to fathom the tremendous age of the earth—and life itself—necessary to support the glacial pace of natural selection. Siegler made his comments in an invited address at the June APS convention in San Diego.

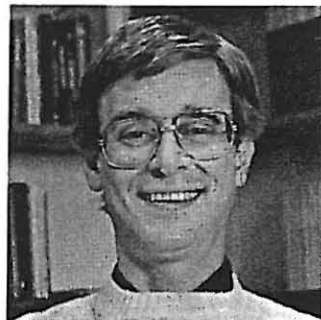
In a more contemporary example, he observed that it's hard to know how urgent the nation's \$350-400 billion budget deficit is if you can't estimate how much that amounts to per year per American family. (It's \$3,000!)

"It's not news that people's ability to estimate is bad," said Siegler of Carnegie Mellon University. What *is* news is that he thinks he's figured out a method to train people to become better estimators.

Making Good Estimates Involves Two Major Factors

Good estimating skills, according to Siegler, calls on two independent sets of knowledge: "metrics" (understanding such statistical properties as the mean, median, and range of a set of numbers) and "mapping" (correctly ordering items along a specified dimension, such as ranking the largest 50 companies in gross revenues, without knowing the absolute

revenue figures). Metrics knowledge uses the process of numerical induction, while mapping knowledge uses heuristics and knowledge specific to the domain of interest. Good metrics and mapping



Robert Siegler

knowledge is necessary and sufficient for good estimating ability, claims Siegler, based on his research with colleague Norman R. Brown.

"Both kinds of information are needed to be a good estimator," Siegler said, "but most tests of estimation ability confound the two facets." This confounding of factors makes it difficult to ascertain an individual's specific weakness in estimating.

For example, he said, some tests calculate mean estimated error of a person's guess at a country's population size compared with the correct figure. But, Siegler said, the difference between the guess and the truth reflects two different sorts of errors: a tendency to always overestimate or underestimate a population, and mistaken notions of the rankings of countries by size.

Siegler has developed what he calls the "cue-validity approach" to estimation, and he tested its usefulness in helping to predict college students' estimates of a country's population and land mass. The approach assumes that estimates are a weighted blend of competing cues, that the weights reflect the cues' predictive values

in the real world, and that availability (the prominence of a piece of knowledge or a figure in daily life) serves as a kind of cue.

Siegler asked students to make estimates for the 99 largest countries (excluding the United States) and examined the accuracy of their estimates based on three cues: availability of information about the country's population and size based on mentions in the *New York Times* index, mental maps of the country's land mass, and students' reported knowledge of each country.

Overall, the students' estimates weren't very good, although there was some positive correlation between them and the actual figures, Siegler said. The students' metric predictions were worse than their mapping predictions (relative size rankings).

Improving Estimating Skills

In a second experiment, Siegler provided some "seed" facts to see what might improve the students' estimating abilities for related facts. Siegler hypothesized that giving the students some population figures would inform them of the general range of realistic figures, and, when linked to specific countries, provide some reference points for estimating rankings. For example, if a student who thought that Sweden contained 30 million people is told it has 7 million people, he/she will then surmise that Norway, which is just a little smaller than Sweden, probably has roughly 5 or 6 million people. The seed facts also help students in making categorical generalizations, such as that European countries don't have large populations, while Asian countries do.

After receiving such seed facts on 24 of the 99 countries, students greatly improved their absolute population estimates for all the countries, but didn't improve their land mass estimates for any but the 24 seed countries, Siegler reported.

The problem, he discovered, was that providing seed facts for arbitrarily selected countries hindered students' ability to draw reasonable generalizations: it was useful to use Sweden as a reference to rank Norway, but Austria wasn't a good reference for Germany, even though

SEE ESTIMATING ON PAGE 23

For the Article Writer . . .

How to Win Acceptances by Psychology Journals: 21 Tips for Better Writing

Robert J. Sternberg
Yale University

The price you pay for an ill-conceived or ineptly written article submitted to a psychological journal is one of the following:

- (a) express-mail receipt of a one-way ticket to the Bermuda Triangle
- (b) an invitation to Hannibal (the Cannibal) Lechter's dinner table
- (c) eternal damnation in the fires of hell
- (d) rejection, or worse, benign neglect of the article if it is published

The keyed answer to this problem is (d), although options (a) - (c) may come to pass in individual cases. You can have million-dollar ideas (although, as a psychologist, you'll probably never see the money), but if you do not express those ideas well, the impact of your work will be severely reduced or even nullified. The scientific process does not end with the completion of research. It continues through writing, publication, and the reactions of your peers and the public.

What can you do to write successfully? I will not repeat here the basic suggestions of the *APA Publication Manual* (3rd ed.) or of the various exegeses of it (e.g., Sternberg, 1988). Rather, I will discuss techniques that go beyond the basics. I will divide my discussion into four parts: what you say, how you say it, what to do with what you say, and what to do with what others say.

What You Say

1. Start strong. "Smith and Jones (1986) found that 83% of readers never got beyond the first paragraph of the majority of articles they began to read."

This opening is an example of how to be boring, as are these: "Past research shows....," or "It is interesting to note that..." (says who?). A strong start asks a question or states a problem pertinent to the theme of your article: "Why are so many psychology articles safe and cheap substitutes for sleeping pills?", for example, or "Dullness blunts the impact of many potentially interesting articles." Tell readers what the article is about in a provocative way that catches their attention.

2. Tell readers why they should be interested. "These findings are interesting and important. Therefore, you should support my promotion to tenure." Don't expect readers to know why you find a topic interesting or why they should find it interesting. Show them! Keep your audience in mind: The more you can relate your topic to concerns of your reader, the more interest you will generate. If you are writing for perceptual psychologists, make contact with the theoretical issues that concern people in this field. If you are writing for teachers, show how your findings can be used to improve teaching.

3. Make sure the article does what it says it will do. "In this article, I will characterize the meaning of life, solve the problem of world hunger, and reveal at long last Richard Nixon's secret plan to end the Vietnam War." Many articles are declined by journals because they do not deliver what they promise. They claim much, but deliver little. For example, experiments should follow from the theory you present. Make sure you frame your article in terms of what you have really accomplished, not in terms of what you wished you had accomplished.

4. Make sure the literature review is focused, reasonably complete, and balanced. "Thus, both studies showed that

high levels of reasoning performance require people to wear propeller beanies on their heads. Other studies, showing that high levels of reasoning performance require pocket protectors, are irrelevant." Reviewers are infuriated by literature reviews that are biased in favor of a single point of view, especially if it's not their own (and chances are good that at least some of the reviewers will have different views from your own). Reviewers are even more upset when their own work is clearly relevant but not cited (can you say, "Sayonara to acceptance?"). And reviewers do not want to read about every marginally relevant study ever done. Make your review complete and current, but also keep it focused and concise, so that it encompasses but does not overwhelm what you are studying.

5. Always explain what your results mean—don't leave it to the reader to decipher. "... Finally, we obtained a 7-way interaction among the independent variables, clearly showing that the variables need to be considered in terms of their interactive as well as their additive effects." Interpret your results. With enough time, readers could figure out the meaning for themselves, but who has time? Don't leave the interpretation for the Discussion section. Speculation and ideas that relate your work to that of others should go in the Discussion. Basic interpretations should be included in the Results section, while people still remember what they are.

6. Be sure to consider alternative interpretations of the data. "Thus, the data overwhelmingly support the XYZ theory, and if you can't see it, you need to have your head examined." No data set is unequivocal. Sooner or later, someone will see one or more alternative interpretations. You are much better off if you recognize and try to discount the alterna-

tives yourself than if you leave it to the reviewers or your potential readers. Even if you cannot discount every alternative, people will appreciate your honesty in recognizing that other explanations could exist. If the results are too inconclusive, your article may be turned down. But even published articles are not fully definitive, and readers expect you to admit as much.

7. End strongly and state a clear take-home message. "In sum, there is a need for further research to clarify the issues." What a snooze! There's always room for further research; readers don't have to be told that. Readers want a punch line. They want to go away from a paper with a clear conclusion, preferably a snappy one (which may or may not be in the last sentence). When the reader later tries to remember your article, this conclusion will probably be the mental access route. Leave readers with what you most want them to remember.

How You Say It

8. Write sentences that are readable, clear, and concise. Sure, you already know this, but some people go on and on and on, repeating themselves and pointing out the same thing over and over again, using dangling constructions, getting off the point, and obfuscating their points to the point where the reader loses sight of what the point is anyway, to extent that there is one, or, as the case may be, more than one.

9. Emphasize logical flow and organization. Don't expect readers to understand the logical sequence of your ideas. It is important that the prose flow and that the organization emerge clearly. Write your ideas in a sensible sequence. Readers should concentrate on what you say, not how you say it. Logical organization can mean the difference between confusion and clarity.

10. Explain what you're going to say, say it, and then restate what you've said. In this way, you provide an advance organization for the reader, explicate the main content, and emphasize to readers what you want them to remember.

11. Be creative, and give concrete examples. Some academic writers harbor the illusion that the more abstract and high-sounding their writing is, the more readers will be impressed. On the contrary, most readers need concrete examples or analogies in order to understand other people's ideas. The more abstract the points, the more readers need examples. Readers are busy: Don't expect them to generate the examples. It's your responsibility. You have all read papers that left you drowning in abstractions. I'll leave it to you to think of specific examples.

12. Don't assume people will "know what you mean," or be familiar with abbreviations or jargon. Sometimes when I'm writing an article, I notice a sentence or paragraph that isn't clear. Occasionally, I'm too lazy to change the offending text, and I hope no one will notice. I'm particularly likely to hope that people will know what I mean when I'm not sure what I mean myself, so that perhaps later they can tell me. Almost without fail, however, readers *don't* understand what I said any better than I do. Reviewers complain about what they don't understand—and that includes abbreviations or jargon. QED.

13. Write to be interesting. An article tells a story. Like a story, it should capture readers' interest. You know what it's like to read (or worse, to *have* to read) someone else's boring articles. Well, guess what? That's what it's like for other people to read *your* boring writing. Write for your reader, not for yourself. Readers appreciate the effort to keep their interest. Ultimately, what matters is whether people read your articles, and if the reviewers don't enjoy reading your work, they won't recommend it for publication. This in turn will make it difficult for others to read your articles, and it's hard to have an impact on the field if no one reads what you write. And don't tell people how "interesting" your results or your papers are. If your article is worthwhile, believe me, people will know it. An interesting point, don't you think?

14. Write for a somewhat broader and technically less skilled audience than you expect to read the article. Writers tend to overestimate the knowledge and technical sophistication of their readers, as well as the extent to which readers share their exact interests. You should therefore write for a slightly broader and less knowledgeable audience than you expect will read the article, keeping in mind that you want to avoid insulting your audience. Somewhere between "Visualize Maculation decamp," and "See Spot run," lies both your audience and the Land of Acceptance Letters.

15. Avoid autobiography. In some schools, you are expected to tell the story of your life when you write a paper, especially a dissertation. This story includes all your false starts, blind alleys, and tales of woe. You may even be expected to explain all the reasons your manipulation didn't work out the way it was supposed to. Journal space is precious, however, and there just isn't room for these autobiographical details. Thus, journal articles are usually written in a manner that bears little resemblance to the way the research was actually conducted. This difference is not dishonesty: Professionals simply know how the system works. I first learned this fact when I was in graduate school. It was a dark and stormy night. I'd just received an editor's letter. (For further details, see my *Complete Life and Works*, Vol. 21, published by Narcismo Press.)

What to Do With What You Say

16. Proofread. As the editor of *Psychological Bulletin*, I find that the single most annoying flaw in a submitted article is a slew of typographical errors. Why? Because they're the easiest thing for the author to correct. It's neither the editors' nor the reviewers' jobs to do your proofreading for you. Always proofread. It's the one thing you can most easily do to improve the impression you make. If you don't proofread, some reviewers and editors will simply tell you to do it. But others won't be so congenial, and you may have problems changing that first impression. No matter what, you loose. **[APS OBSERVER EDITOR: SIC!]**

SEE WRITING ON PAGE 18

MEDAL FROM PAGE 1

Both fields grew in part from his idea that computers could process symbols as well as numbers and, if programmed properly, would be capable of solving problems in the same way that humans do.

"He spent his life enlarging [his] vision, shaping it, materializing it in a sequence of computer programs that exhibited the very intelligence they explained," said Carnegie Mellon's Herbert A. Simon at a July memorial service. Simon, a Nobel laureate and APS William James Fellow, also said of his former colleague that in addition to being a great scientist

Newell "was also a great artist, struggling to create form against the severe constraints imposed by nature."

Newell's work in cognitive science focused on problem solving and the cognitive architecture that supports intelligent action in humans and machines. From the early 1980s, his work centered on the development of "Soar," artificially intelligent software capable of learning and solving problems in ways similar to those of human beings. Soar has been in use as the framework for several intelligent systems at research institutes around the country for about five years.

Gibson

Gibson is best known for her dynamic theories of perceptual learning and perceptual development. Her new concepts broke away from reinforcement learning and associative learning theories that she found were "were inadequate to handle" her new research.

For Gibson, perception and learning are inseparable and interactive. "We learn to perceive as well as perceive to learn," she stated in her 1991 volume, *An Odyssey in Learning and Perception* (Bradford Books, MIT Press).

She was cited for the National Medal of Science for her "conceptual insights in developing a theory of perceptual learning and for achieving a deeper understanding of perceptual development in children and

basic processes in reading."

Gibson is the Susan Linn Sage Professor of Psychology emeritus at Cornell University and currently is working on a new book with Anne Pick on the topic of perceptual development. Pick is a professor of psychology at the University of Minnesota.

Pick has said of Gibson, "Her work has a very functional emphasis and a focus on the creature in the environment. She is concerned with adaptive behavior and processes of development in relation to the resources of the environment. Her work with infants stresses the infant/environment fit and the mutual control of perceiving and acting. From the perspective of her work, perception is cognitive because it yields knowledge. This is very different from much other current work on perceptual development

characterized by use of outline drawings or other static displays."

HERBERT A. SIMON

In a telephone interview with the *APS Observer*, Gibson, 81, commented on some of the ideas in her career of study, research, and teaching that she recounts in *An Odyssey in Learning and Perception*.

Commenting on the dynamic nature of her perceptual learning theory, Gibson said, "I think that anyone who works with infants or young animals would agree that they appear to be eagerly seeking information. We have had a lot of success doing research in infant perception because researchers began to make use of the fact that infants were seeking information, they began to see that you could use natural exploratory behaviors to find out what the baby was perceiving

"As babies develop abilities to act in new ways like reaching, for instance, what

they perceive also develops. Their perception of where they are and what they can do becomes more accurate. I believe that the development of action and the development of perception, which is informed by action, go on together. I am talking about development that includes both maturation and learning."

Commenting on her notion of "affordances" in her theory of perceptual learning, Gibson said, "This is a way of thinking about perception and learning and what environmental opportunities provide support for a particular animal. The affordances have to be related to the animal's niche, the way the animal lives, its anatomy, its dynamic powers, to all the characteristics of the animal. There is a very close reciprocal relationship between how the animal is organized—what it inherits, what it can learn and what it can do—and what its environmental opportunities are."

Gibson said she now thinks of the visual cliff experiments for which she is known "as an almost perfect example of an animal behaving in accordance with the affordances of the environment. The environment must provide a firm surface for traversal. So as soon as children can crawl, they need to determine whether the ground ahead provides support for putting their weight on it and moving forward. It's important that an infant be able to detect a safe surface." [In this experiment, the baby's mother urges the infant to crawl

over a clear glass surface across what the baby perceives as a drop-off or cliff. All but a few babies hold back and refuse to cross over it.]

When talking with young psychologists about their careers, Gibson emphasizes flexibility in using the opportunities

that circumstances afford. She said her life experience suggests that "young psychologists today should be ready to work where the opportunities arise, and

... young psychologists today should be ready to work where the opportunities arise, and ... if they do so they will be able to use those opportunities to further the special talents they bring with them.

ELEANOR J. GIBSON

CONTINUED ON NEXT PAGE

FROM PREVIOUS PAGE

that if they do so they will be able to use those opportunities to further the special talents they bring with them." It's important not to be rigid, she said.

Among Gibson's many admirers is Edward Reed, psychologist and philosopher of science at Franklin and Marshall College in Lancaster, Pennsylvania, who rates Gibson, "the top of the top." (Reed is author of *James Gibson and the Psychology of Perception*, a biography of Eleanor Gibson's husband published by Yale University Press in 1988.)

Reed said, "She is unique—she stands among a small handful of the most important contributors to twentieth century psychology." Of her accomplishments, Reed said "There are three or four fields that she instigated to a large degree, to which she gave conceptual and methodological foundations. The book she published in 1969 [*Principles of Perceptual Learning and Development*, Appleton-Century-Crofts] so excited the psychological community that there was a tremendous takeoff of work on perceptual development So the 1970s were a time of excitement in visual perceptual development studying infants and toddlers. And a lot of that you have to lay at Jackie Gibson's door."

"About that time she was involved in the reading project, Project Literacy. Reading had definitely been on the back burner of psychologists—it really had died out two generations earlier. But Project Literacy stimulated a major takeoff of research and interest in reading," he said.

"Then, when she finally became a tenured person in her own right at Cornell in the late 1960s she began pushing her own views and her modifications of [her husband] Jimmy Gibson's ideas. At first she was calling it the ecological optics of infancy," said Reed.

"Now she works on not only perceptual learning but also control of behavior and an ecological approach to infant behavior

and development. That has been tremendously influential and there are many people working in that area following paradigms and ideas that Eleanor started. The influence she had is both conceptual and experimental—she had good ideas, but she also showed you how to do an experiment, which is a big thing for her—and other people followed suit in both directions," Reed elaborated.

[Gibson] is unique—she stands among a small handful of the most important contributors to twentieth century psychology.

EDWARD REED

"It's worth noting that she did much of this work before 1970 when she wasn't even an official academic person yet. So there is a whole story about what you can do even if you are marginalized in science. She was working on soft money, often with other people's grants. She nevertheless had such good ideas that she was able to carry out work of major significance A lot of the story is having ideas, and maybe more importantly, having the stamina to slog it out even under not such good circumstances."

Past Medals

A total of 304 National Medal of Science awards have been made since President John F. Kennedy made the first one in 1962. They are made in special recognition of outstanding contributions to knowledge in the behavioral, biological, mathematical and engineering, and physical sciences, according to the National Science Foundation, which administers the awards for the President. To date, ten psychologists, including Gibson and Newell, have received the national honor: George A. Miller (1991), Patrick Suppes (1990), Roger Sperry (1989), Anne Anastasi (1987), Herbert A. Simon (1986), B.F. Skinner (1968), Harry F. Harlow (1967), Neal E. Miller (1964).
D.K.

NOMINATIONS SOUGHT

Alan T. Waterman Award National Science Foundation

The Alan T. Waterman Award Committee invites nominations for the 18th annual Waterman Award, to be presented in May 1993. This award is presented by the National Science Foundation (NSF) and the National Science Board to an outstanding young researcher in any field of science or engineering supported by NSF. The 1993 award consists of a citation, a bronze medal, and grants of up to \$500,000 for a period of up to three years for research or advanced study in the biological, mathematical, medical, engineering, physical, social, or other sciences at the institution of the recipient's choice.

Candidates must be U.S. citizens or permanent residents and they must be 35 years of age or younger, or not more than 5 years beyond receipt of the PhD degree by December 31 of the year in which nominated. Candidates should have completed sufficient scientific or engineering research to have demonstrated through personal accomplishments, outstanding capability and exceptional promise for significant future achievement. In addition, candidates should exhibit quality, innovation, and potential for discovery in their research.

Information on the regulations, procedures, and background of the award as well as required forms are available from: Mrs. Susan E. Fannoney, NSF, Waterman Award Committee, 1800 G St., NW, Washington, DC 20550, tel.: 202-357-7512. For candidates to be considered for the 1993 award, nominations must be postmarked by December 31, 1992. The nomination form must be typewritten and returned with 15 copies. Renominations may be submitted via an updated nomination form, or, if there is no additional information to add, you may call 202-357-7512 to request renomination of the candidate. The names of four references are required for each nomination. All nominations will be considered, regardless of receipt of formal references. Completed reference forms may accompany the nomination form or be sent separately. The deadline for receipt of references is one month after that established for receipt of the nomination form.

BYLAWS FROM PAGE 1

flourishing with members enthusiastically receiving subscriptions to two well-respected journals and an extensive bimonthly newsletter. We hold a well-attended, highly participatory annual scientific convention, and we have become a major voice representing the interests of scientific psychologists in Washington. It is appropriate now for us to look back and reflect on our organization's foundation document.

Review Committee

A special Bylaws Review Committee, chaired by one of the original drafters and APS's first president, Janet Spence, and including Ann Howard and Virginia O'Leary, recently completed a comprehensive review of the Society's organizing document in compliance with the constitutional mandate. "We revisited the original document," says Spence, "to make sure we are responsive to any new situations. Bylaws need to be flexible and supple."

The review committee was charged with formulating recommendations for any necessary changes. Their recommendations were presented and approved by the APS Board of Directors at its meeting in San Diego in June. The specific proposed bylaws changes will be voted on by the APS membership by mail ballot during the Fall of 1992.

Several key proposed changes are summarized below. A side-by-side presentation of all proposed changes, current bylaws language and a rationale for the proposed changes will be printed in the bylaws ballot.

▼ Three-Year Presidential Cycle

A recommendation for a change in the term of the APS presidency is one of the more significant changes the membership will be voting on. Currently, the President serves a two-year term. It has been recommended that the term be a **three-year cycle**, with one-year terms each for President-elect, President, and Past-President. Each year in late Fall/Winter the new President-Elect would be chosen by mail ballot with the presidential term to begin at the

APS convention the following June. At that time the three presidential positions would rotate one slot, with the Past-President retiring. In addition, it was recommended that the Board continue to be comprised of six Members-at-Large, as is currently the case, but that instead of the current four-year terms, they will serve three-year terms, two to be elected each year. This last provision is intended to help maintain a congruent rotation with the Presidency and to provide greater continuity in leadership and an effective use of the experience and expertise of APS's leaders.

▼ Board Composition

It is recommended that the Board be comprised of between nine and eleven members (three in the President cycle, six Members-at-Large, and a Secretary and Treasurer who may or may not be Members-at-Large). The Board would annually appoint the Secretary and Treasurer who serve as ex-officio (non-voting) members, the Secretary eligible for reappointment up to three years, and the Treasurer for up to six years.

This recommendation is based on the need for the governing body to be large enough to conduct the business of the Society in the event several members were unable to attend a meeting, and yet not so big as to be unwieldy or expensive to sustain. Also, the composition of the Board would be large enough to reflect the diversity of the membership. And, the proposal addresses the necessity for the Board to have the ability to appoint someone with the requisite skills and experience, as in the case of the Treasurer, to benefit the Society.

▼ Standing Committees, Members, and Terms

The Society's proposed standing committees are Awards, Convention, Elections, Finance, Membership, and Publications. These are the six committees actually now in place, and the ones we are likely to require for the near future. Should they be needed, "special commit-

tees" may be appointed and in later bylaws be promoted to standing committee status. The members and chairs of each committee will continue to be appointed by the President, with the approval of the Board, so as to avoid the burdensome process of soliciting nominations and conducting elections for all committee positions.

The initial bylaws formally mention only the Membership Committee and the Elections Committee, and "such special Committees as may be established by the Board of Directors." The six proposed standing committees (Elections, Membership, Publications, Convention, Finance, Awards), reflect the longterm governance needs of the Society.



Janet Spence chaired the Bylaws Review Committee.

The Bylaws Review Committee and the Board were guided in the above proposed changes and all of their recommendations by a firm commitment to remain "lean and nice." It is vital for its continued health that the Society be representative of the interests of all areas of scientifically oriented psychology. Maintaining a diverse Board and committee membership, as well as a convention program that represents the entire discipline, is a guiding principle for all proposed bylaw revisions. APS was well started four years ago by founders who had the foresight and vision to provide for change. Now is the time to make whatever changes are necessary in our bylaws to strengthen our organizational structure and clarify the powers, conditions, and terms of service of the Society's officers while remaining true to our beginnings. ♦

Member Profile

Norman Krasnegor: Chief of NICHD Learning And Behavior Branch

Biology and Behavior

"Many scientists are convinced that biology propels behavior, and that behavior is a sort of epiphenomenon of biology," says Norman Krasnegor.

"On the other hand, there are many scientists who study behavior and never learn anything about biology. And there are some who would like to know where the interaction between the two lies.

"Understanding that interaction is, precisely, one of the tasks I have set for myself. I have worked on it throughout my scientific career," said Krasnegor, an APS fellow and psychologist in charge of what may be one of the largest bodies of behavioral research funded by the National Institutes of Health.

"In all the books I've written, the conferences I've presented at, and the jobs I've had I have mixed those two things together in a systematic way to ferret out how biology and behavior influence each other," said Krasnegor.

"I'm convinced the arrow points in both directions, no matter where you are in your development. Otherwise, we would all be predestined—my genes would be what brought me to this office at this moment."

The office he is in at the moment of the interview is the Human Learning and Behavior Branch, and Krasnegor is its chief. His branch is one of six divisions of the Center for Research for Mothers and Children, which in turn is one of two divisions that compose the extramural side of the National Institute of Child Health and Human Development.

And the moment itself, predestined or not, is approximately seven weeks before the close of the federal government's fiscal year. So it is a rather busy time for a branch that annually funds about \$37 million in behavioral research.

Budget and Development

The \$37 million is just about the biggest behavioral research budget of any branch of the National Institutes of Health, Krasnegor notes. Furthermore, "our branch is fairly unique at NIH in the sense we are focused on behavior as a unique part of the developmental repertoire of evolving human beings," he said. "Most other branches in behavioral research are involved in it vis-a-vis a specific disease. We are interested in what behavior does and doesn't do for a person and how it interacts with all the things that happen, the biological as well as the psychological."

Krasnegor is the senior editor of 12 or 13 books that have brought together much of the behavioral research done in his branch over his 12 years on the job. They deal with behavioral pharmacology, childhood obesity, perinatal development, mammalian parenting behavior, and a dozen other behavioral areas. A new one appearing in September is *Developmental Aspects of Health Compliance Behavior*.

As his latest volume goes to press Krasnegor will be flying to Paris with about 16 other psychologists early in September for an international meeting his branch organized on the psychobiology of fetal development. The goal is better understanding of what fetal capacity is, and one of the results may be that scientists will be able to better design environ-

ments for low birth-weight children and those born prematurely in order to give them a better start in life.



Norman Krasnegor

Brain and Behavior

From the fetal state, through the neonatal state, to infancy, childhood and adolescence and on to early adulthood in the late teens or early 20s is the part of the developmental life span on which Krasnegor and his colleagues focus. They have five or six strong centers of interest.

Learning and cognition are an area of great interest, and this is true for some other government research programs as well. "But our branch is focused mainly on the development of those functions in children, going again from the fetal period to the beginning of adulthood. The goal is to understand basic mechanisms that underpin learning and cognition both in the behavioral sense of those terms, and how they relate to the brain, and how both of those sides of the equation, biology and behavior, interact to produce behavioral development."

Normal Emotion and Social Interaction

Social and emotional development of children is another field of major interest—how neonates and older infants relate to their mother, how the child integrates in the family, how the child begins to make connections with peers, and then ultimately, as an adolescent and young adult, how the individual becomes able to make new relationships outside of those earlier spheres.

"We are not interested in the pathological side of emotion, as the National Institute of Mental Health is—we are mostly interested in normative develop-

SEE KRASNEGOR ON PAGE 20

WRITING FROM PAGE 13

17. Check for fit to journal guidelines and subject matter. One of the single most common causes of outright rejection is the submission of articles that even a casual review would reveal to be inappropriate for that journal. For example, people send me, as editor, empirical studies of substantive psychological phenomena, despite the fact that the *Psychological Bulletin* never accepts articles of this type. They waste their own time and mine. We also return articles that depart substantially from APA writing guidelines (e.g., are single-spaced, or use notes in place of references). You can save yourself and others a major headache by checking that your article fits the intended journal. (You've probably guessed by now that this very article was rejected from *Physical Sciences*.)

18. Read your paper at least once while imagining yourself to be a critical reviewer, or even better, ask a colleague to do the same. We tend to be enamored of our own work. We often don't see the flaws that would be obvious if the same paper had someone else's name on it. So try reading your paper with the same devastating analytical acuity you would use if you wished to demolish the work of your most loathsome enemy. Ask a colleague to do the same. In this way, you will be able to anticipate and perhaps eliminate some reviewer criticisms—use of faulty logic, for example. If your logic is faulty, your paper suffers; of course, this also means that if your logic is perfect, so is your paper.

What to Do With What Others Say

19. Take journal reviews seriously, but remember that reviewers are not gods (a fact that has escaped some reviewers). Many, but not all, criticisms by reviewers are credible. Sometimes, individual comments are downright asinine. But points gain force when they are repeated across reviews, or by the editor in his or her letter. You don't have to make every change suggested in every review. But should you be given the opportunity to revise, you are expected to write a letter accompanying your revision. This letter should explain to the editor how you dealt with each point of criticism, or why you

did not respond to selected points. You should realize that although you usually don't have to address every point in every review, the comments made by the editor should not be ignored. Reviewers and editors do not expect perfection; they do expect, however, to be taken seriously. They put the time and effort into reviewing the article, and want to see something for it.

One final note about reviewers. People often whine and moan about how nasty reviewers are. Some of them are. But remember: We have met the enemy, and we are it. Reviewers are drawn roughly from the same pool of people as those who write articles. If we all do our part, there will be fewer nasty reviews. And if you don't agree with me, you must be stupid and utterly worthless.

20. Don't take reviewers' comments personally. Reviewers criticize work, not people (unless they do their job incorrectly). I have written fairly strong critiques of the work of some of my closest friends in the field, and they have done the same of my work. We know better than to take professional differences personally. If you do so, you will find yourself holding grudges against an awful lot of people. Send me a self-addressed stamped envelope (with \$10 worth of postage), if you'd like a copy of my own 300-page list of personal enemies.

21. Perseverance pays, to a point. During my editorship, no article submitted to the *Psychological Bulletin* has been accepted outright with no changes. In other journals, the rate of outright acceptance may be slightly higher, but not by much. It can easily take two, three, or even more revisions before an article receives final acceptance. Journal editors differ in terms of how many rounds are typical. Moreover, even if one journal flatly rejects your article, another may love it. I'm not alone in having been brutally rejected by one journal, only to be welcomed with open arms by another. But if your article is being rejected across the board, you need at least to consider the possibility that you don't need to go to the supermarket for your next turkey.

Finally, remember that the journal reviewing process, and science as a whole, are basically conservative. Articles are often rejected because they are just not very good, but I do believe that some of

the best work in psychology and in other sciences is rejected because people are not yet ready to hear the message (see Sternberg & Lubart, 1992). I'm not personally impressed by people who tell me they've never had an article turned down.

To do creative work, you must take risks, and to take risks, you must occasionally fail. Much more important than whether you fail (and everyone does sometimes) is how you handle the failure and learn from your mistakes. Should you ever reach the point where you never fail to get your articles accepted, and where no one ever disagrees with you, beware: You are probably not doing your best and most creative work. And if you really want to avoid rejections, then don't take chances. Never submit. You'll be completely safe from criticism, and from making a scientific contribution as well.

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Author Notes

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Minority Scholars in Psychology Receive NRC Fellowships

WASHINGTON, DC—Thirteen psychology scholars were among the 100 minority scholars who received fellowships in two Ford Foundation programs. A total of 55 predoctoral students and 20 doctoral dissertation candidates have won awards in the seventh year of the **Ford Foundation Predoctoral and Dissertation Fellowships Program**. Fellowships also were awarded to 25 doctoral degree recipients in the thirteenth year of the **Ford Foundation Postdoctoral Fellowships for Minorities Program**. Both programs are administered by the National Research Council (NRC).*

Predocorral Fellowships provide funds for stipends and tuition for three years of tenure. Dissertation Fellows receive a stipend for a nine- or 12-month tenure. The Predoctoral and Dissertation Fellowships Program seeks to increase the presence of underrepresented minorities on the nation's college and university faculties. The Ford Foundation Postdoctoral Fellowships Program identifies individuals of high ability and enables them to engage in postdoctoral research and scholarship in an environment free from the interference of their normal professional duties. In sponsoring these fellowship programs, the Ford Foundation endeavors to support scholars in achieving their full potential and in attaining greater recognition in their respective fields.

Plans for the 1993 fellowship competitions are now under way. Further information and application materials will be available after September 1, 1992, from the Fellowship Office, National Research Council, 2101 Constitution Ave., NW, Washington, DC 20418.

Three APS student members (listed below) are among the nine psychology Predoctoral Fellows and the four psychology Dissertation Fellows.

Predocorral Fellow award

Laura Patricia Kohn, *Univ. of Virginia, Clinical Psychology*

Dissertation award

Diana I. Cordova, *Stanford Univ., Social Psychology*
Lisa Dianne Ordonez, *Univ. of California-Berkeley, Quantitative Psychology*

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* The National Research Council is the principal operating agency of the National Academies of Science and Engineering.

ment," he said. "The branch's focus in this regard is best exemplified by a prospective longitudinal study, birth to three years of age, of children who are receiving day care. This investigation of 1,200 children will provide answers concerning the effects of day care on social and emotional and cognitive development and give important information on normative development," he explained.

Learning the Hard Way

However, Krasnegor's office does support major research in "learning disabilities," which he likes to put in quotation marks to show that it is a popular expression that his branch is trying to make sense of, a term used many different ways by many different people, he says.

"We are trying to break down that term systematically from a scientific point of view to understand specific mechanisms and then apply such knowledge to the clinical domain."

A lot of the research that has been done on dyslexia, dysgraphia, dyscalculia and other listening, speaking, or communication problems "hasn't been done based on good scientific criteria so there is no good way to replicate it, sample to sample, and compare and contrast the information that has been gleaned from one study to another," Krasnegor said.

"We've got a lot of signal-to-noise-ratio problems and we don't know what many of those [old] studies mean," he said.

There are also widely different criteria for defining learning disability from one state of the union to another, or one county to another, or even one school system to another, he said.

"So if you live in one state and you're defined as learning disabled and then you go to another, all of a sudden you are cured. Why? Because they have different criteria in the second state.

Standardization

"Ultimately, what we are trying to do is develop universal measures which will be based significantly on scientific research measures and will allow one to test children appropriately so that no matter where you live you will have the same basis for making decisions about a particular child's problem."

Their research on learning disabilities has "rocked the boat in the advocacy community," Krasnegor said, because the parents of the children so designated or labeled "are very concerned." The rubric term "learning disabilities" characterizes what they say is wrong with their child and they don't want to let go of that because they want to have something special done for their child. And I can understand that.

"What we are trying to understand is what that child has, or what that class of children has, and to make available all the usual appropriate and rigorous scientific thinking and experimentation that would lead to an understanding of what is going on—and then, to the extent possible, provide that information to clinicians and legislators or whoever wants to use it," said Krasnegor.

Behavioral Pediatrics

Another major area of research supported by Krasnegor's branch is in behavioral pediatrics, and top attention here has been going to childhood injuries. Injuries cause greater morbidity and mortality in children and young adults (from two years of age to 25) than all of the next six causes combined, he said. The researchers are looking at antecedents to injury, looking at risk factors, trying to understand the prediction variables and attempting to figure out how to intervene to prevent the accidents that take the lives of so many children.

Krasnegor was trained as a comparative and physiological psychologist, received his PhD from the University of Maryland in 1970 and did his post-doc in behavioral medicine at Johns Hopkins. He focused on evolution of brain-behavior relation-

ships, as an intramural scientist at the Walter Reed Army Institute for Research, and on behavioral pharmacology of substance abuse, at the National Institute on Drug Abuse, before becoming chief of NICHD's Human Learning and Behavior branch about 12 years ago.

Getting Research Funding

The question he has heard most across those years is "How can I get funding for this project?" Therefore he and his staff of health scientist administrators have great experience in giving helpful replies to all phone and mail inquiries.

He has attended every APS convention since the start to spread news about how to position research for funding.

Formal applications can be made at three different times of the year. But Krasnegor recommends a phone call at any time to him or one of his colleagues as a first step. One of them will evaluate the caller's proposal or idea on its merits and from the point of view of whether it belongs in NICHD or some other institute. They also stand ready to give information about how to prepare a grant's focus to maximum possibilities of fitting requirements and getting funded, even if the inquiry is only at the "great new idea" stage.

NICHD staff Peter Scheidt handles injury research, Sarah Friedman deals with day care and social and emotional development, G. Reid Lyon handles communication ability and learning disabilities, and Krasnegor manages behavioral biology, perception, early learning, perinatal development, behavioral medicine and other miscellaneous areas. They can be reached by phone at 301-496-6591. **D.K.**

The Editor welcomes your letters to the Editor

Submit typewritten letters of up to 300 words in paper form and, if possible, on computer diskette: DOS (5.25" or 3.5" diskette) or Macintosh (3.5" diskette). Indicate which word processor you used or, ideally, save as an ASCII or text file.

Can We Teach Critical Thinking Skills?

As part of a trend in the nation's colleges and universities, psychologists are devising strategies—including using APS's *Current Directions*—to teach students to think critically. At the annual APS meeting, several psychologists discussed their approaches in a well-attended symposium and detailed their successes in what one of them calls "applied cognitive psychology."

State Mandates

In California, thanks to a recent state requirement, "we're now trying to teach more than one million adult students to think critically," reported Diane Halpern of California State University-San Bernardino. The question, she said, is "Is it possible?"

Psychologists are at the forefront in

addressing that question, Halpern said, because most universities turn to psychology departments to offer the required course. But, she added, "it turns out to be a very difficult question to answer."

Determining Success

Determining whether it is possible to teach critical thinking presents a host of problems: settling on an operational definition of clear and effective thinking; developing measures that can pick up subtle changes—the best that can be expected from short-term instruction—and that tap skills that transfer to real-world situations; separating the effects of instruction from those of maturation; and identifying lasting gains.

Despite the problems, existing evidence suggests that it is possible to teach students to think critically, Halpern said. The study that perhaps has attracted the most scrutiny was conducted in Venezuela, through its "Ministry of Thinking Improvement" and with the collaboration of American psychologists. The study was a controlled comparison of hundreds of students who had received instruction in ordering and classifying information, problem-solving and decision-making, and creativity. The students outperformed controls on tests, oral arguments, and open-ended essays on novel topics, Halpern said.

Additional studies that have examined students' self-reports of improved critical thinking; gains in IQ scores; Piagetian cognitive growth; use of mental representations that mirror those of experts; use of cognitive skills that comprise critical thinking (such as understanding the difference between correlation and causation); and spontaneous transfer of critical thinking skills to non-classroom situations like political campaigns, have all supported the hypothesis that critical thinking skills can be taught, Halpern concluded.

Curricula

Douglas A. Bernstein has developed a course in critical thinking for his students at the University of Illinois. He defined

Human Factors Group Addresses Usability in Medical Devices and Equipment

SANTA MONICA, CA—Demand is growing among individuals and organizations that provide health care and rehabilitation services for user-oriented devices, equipment, and processes. The heightened demand stems, in part, from an escalation in the complexity of medical technologies as well as therapeutic techniques. In many cases, rapid technological advancement has introduced new usability problems and safety concerns.

Another factor is the number of injuries and deaths that may have been prevented through better design. For example, the U.S. government has documented 9,000 cases since 1984 in which patient injury or death was related to human error in the use of medical and therapeutic devices.

Recently, a new interest group was formed among members of the Human Factors Society for the purpose of applying human factor/ergonomics research to increase the safety, usability, and efficiency of medical devices used by both health care workers and impaired persons.

Members of the Medical Systems and Functionally Impaired Populations technical group are interested in improving the effectiveness of medical systems and enhancing the quality of life for people who are functionally impaired. They are also concerned with improving the interaction between care givers who use medical equipment and their patients in order to reduce errors that can lead to injury and death. The group's goals include designing and testing devices to assure user comfort and satisfaction, adapting work environments and tools to meet people's needs and capabilities, and improving ways to evaluate an individual's impairment and establish an effective treatment.

Membership in the Medical Systems and Functionally Impaired Populations technical group is open to all persons who share these goals. To obtain an application, contact the Human Factors Society, PO Box 1369, Santa Monica, CA 90406-1369, USA; Tel.: 310-394-1811, fax 310-394-2410. Annual dues are \$4.00; membership in the Human Factors Society is not required.



The Human Factors Society is a multidisciplinary professional organization of 5,000 persons in the United States and throughout the world. Its members include psychologists, engineers, designers, and other scientists and professionals, all of whom have a common interest in designing systems and equipment to be safe and effective for the people who operate and maintain them.

CONTINUED ON NEXT PAGE

NEWELL FROM PAGE 27

RAND, he met Nobel Prize laureate Herbert Simon, then a professor of industrial administration at Carnegie Institute of Technology (CIT), now Carnegie Mellon University. Their discussions on how human thinking could be modeled led Newell to come to Pittsburgh so the two could collaborate. Newell earned a doctoral degree in industrial administration from CIT's business school in 1957.

Newell joined the CIT faculty as a professor in 1961. He played a pivotal role in creating Carnegie Mellon's School of Computer Science and elevating the school to world-class status.

Newell, the U.A. and Helen Whitaker professor of computer science at the time of his death, wrote and co-authored more than 250 publications, including 10 books. He co-authored *Human Problem Solving* with Simon in 1972, and co-authored *The Psychology of Human-Computer Interaction* with two colleagues in 1983. His most recent book, *Unified Theories of Cognition* (Harvard University Press, 1990), is based on the thesis that tools are at hand that will allow cognitive scientists to develop one unified theory to describe many different types of behavior, instead of building separate theories to cover isolated aspects, as has long been the practice. A system based on a unified theory could support the full range of intelligent behaviors.

Newell has received innumerable awards for his research and he was a member of the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences. He was the first president of the American Association for Artificial Intelligence and president of the Cognitive Science Society. In 1987 he delivered the William James Lectures to the Department of Psychology at Harvard. Those lectures formed the basis for his book, *Unified Theories of Cognition*.

Newell was survived by his wife Noel and his son Paul. ♦

FROM PREVIOUS PAGE

critical thinking as "the process of assessing claims and making judgments on the basis of well-supported evidence."

Bernstein tries to foster that process by instilling motivation to apply critical

thinking skills and providing practice.

Working with classes as large as 750 students, Bernstein uses TV commercials, print ads, and reports in psychology journals to train students to

work through the five basic steps in critical thinking:

1. What am I being asked to believe or accept?
2. What evidence is available to support the assertion?
3. Are there alternative ways of interpreting the evidence?
4. What additional evidence would help evaluate the alternatives?
5. What conclusions are most reasonable?

In one exercise, Bernstein has teams of students read a psychology journal article and work together to evaluate the extent to which authors have presented persuasive evidence. The students "present" the paper to the class and propose a redesign, and other students ask questions and offer critiques.

Bernstein recently has used articles about the importance of early mother-infant contact for bonding, the value of mental practice on sports performance, and the value of aversive conditioning treatment for alcoholism.

A Trick to Teach

James W. Kalat, at North Carolina State University, takes the charge of

instilling critical thinking even further: he performs "parlor tricks" to teach students to seek parsimonious explanations for seemingly psychic phenomena. For example, using a trick he learned from Rowland Miller at Sam Houston University, Kalat asks a student to select a card from a brand new deck and to show it to



Presenters and discussants at the APS convention symposium on teaching critical thinking skills (left to right): Ruth Ault, Arthur Kohn, James Kalat, Douglas Bernstein, and Diane Halpern

the class. Kalat then tells the student to telephone a "stranger" (e.g., a colleague of Kalat's in another state), who correctly identifies the card to the student. The student unknowingly reveals the card's identity to the telephoned stranger (actually a confederate) by repeating what Kalat told the student to ask the stranger. Kalat is careful to make the instruction to the student subtle, but it is the instruction (e.g. "Ask for my colleague Dr. Horn") which carries the message as to which card was drawn from the deck.

"The trick impresses students a great deal, but if someone catches on to the fact that I didn't tell the student what to say to the telephoned colleague until *after* the card was revealed, I spook them further by inviting them to call someone else. Of course I choose this someone else based on what card was drawn," explained Kalat. Using this follow-up strategy is tremendously effective in stumping the students. The trick's 50% success rate is due, said Kalat, primarily to a failure to follow the instructions to the letter.

Having gained the students' attention, Kalat works them through the trick's mechanics to show them how it is done, and if the follow-up strategy was used, he

CONTINUED ON NEXT PAGE

FROM PREVIOUS PAGE particular area of interest more widely.”

Then this past winter, Dirlam received his first issue of *Current Directions in Psychological Science*, APS's newest journal, and realized it presented the

is able to show them that it is specifically the use of the *two different* techniques of getting the stranger to “identify” the card that creates, not to mention awe, the logical conundrum.

Current Directions as A Teaching Resource

While he did not present in the critical thinking symposium, psychologist David Dirlam of King College in Bristol, Tennessee—in a vein similar to Bernstein's—is launching a new course in the fall in which he hopes to increase students' abilities to critically assess research reports in psychology journals.

He had been teaching a course for psychology majors in how to read journal articles and interpret statistics. The problem with using most journal articles, he said, is that students “don't know how to follow them up or pursue their own



David Dirlam

perfect platform for giving his students the tools to enable them to keep up with rapidly changing research fields.

“I want my students to get excited about reading psychology and to keep at

it,” he said in an interview. Before *Current Directions*, he often had to sit down with individual students and spend two or more hours working through a research article of interest. Now, he says, “top people are writing about their fields in ways that are accessible.”

Starting in the fall, Dirlam's classes will read a *Current Directions* piece, and discuss questions such as: How did a particular psychologist's approach to the subject influence the methods used to carry out research? What kinds of questions does the method prompt, and what kinds does it overlook?

All the psychologists are confident that students can learn to approach the world critically. But, warns Bernstein with a note of delight, “when you do this, you're creating a whole class of troublemakers. They tear apart any journal article they read.” **Chris Raymond**

ESTIMATING FROM PAGE 10

students used it as one.

So, in a third experiment, Siegler selected the countries to provide seed facts for to elicit appropriate and accurate generalizations. To do that, he had to diagnose where students were consistently erring and why. One recurrent problem was that they consistently overestimated the size of small European countries and underestimated large Asian countries.

To test the merits of selecting seed facts, Siegler chose them to either confirm student mis-estimates or disconfirm them. In the latter case, for example, Siegler provided information on only 6 countries—but they were three small European and three large Asian countries.

The students who received the disconfirming seed facts did much better in estimating the rankings the second time around, while those who received confirming facts did worse. Receiving either confirming or disconfirming facts helped the metric (population size) estimates.

Siegler concluded that “a seed set can improve both metric and mapping [abilities] if it's consistent, informative, and valid.”

Educational Implications

Siegler says that the educational system has historically oscillated between pedagogical approaches emphasizing learning facts and those emphasizing learning concepts. “Neither of these alone is adequate. You really need both if you're going to have a reasonable understanding of quantitative domains.” **Chris Raymond**

* ANSWER: Canada: about 25 million; Indonesia: about 175 million.

Psych Bytes...

3,353 PhDs Earned In Psychology in Academic Year '89-'90

According to data compiled by the U.S. Department of Education, a total of 3,353 psychology doctoral degrees were awarded to 1,414 men and 1,939 women in the academic year 1989-90. Among those are some education doctorate degrees (e.g., those earned at colleges of education in counseling psychology and school psychology). PsyD degrees are not included in the total.

Shahin Hashtroudi Memorial Award

On February 24, 1992, Shahin Hashtroudi, Professor of Psychology at the George Washington University, was killed in a robbery near the National Institutes of Health in Bethesda, Maryland. Professor Hashtroudi's family, friends, and colleagues have established the Shahin Hashtroudi Memorial Foundation to provide an award for psychology graduate students who are pursuing research on human memory. The award will be administered by the American Psychological Society. The first award will be for the academic year 1993-1994. Further information will appear in the November issue of the *Observer*.

Animal Research Opportunities

Topeka Zoological Park

The Topeka Zoological Park has established a Scientific Studies Program and invites scientifically competent studies that contribute to: (1) conserving and/or preserving threatened or endangered plants and animals; (2) maintaining or improving husbandry of plants and animals in a zoological park; (3) understanding the biology, behavior, medical care or other scientific disciplines dealing with plants and animals; and (4) understanding the functional dynamics of a modern zoological park.

Proposals will be reviewed by the Zoo Scientific Studies Committee. For more information or to submit proposals, contact Dr. Hugh Quinn, Director, Topeka Zoological Park, 635 SW Gage Blvd., Topeka, KS 66606-2066, tel.: 913-272-5821.

APS Proudly Announces First *Elected* Fellows

The following seven APS Members were elected to Fellow status in June, 1992. They join the ranks of the nearly 2,350 other APS Fellows. When APS started exactly four years ago until early this year, it "grandfathered" as Fellows those who had been Fellows in related organizations. But now that APS has matured to the point of having a fully functional APS Fellows Committee to review Fellows nominations, this year marks the first in which new Fellows were added to APS's roster following the criteria established for Fellows. (See March, 1991, *Observer*.)

The elected APS Fellows are:

Harris M. Cooper, PhD, University of Missouri-Columbia, for outstanding contributions in integrating research, meta-analyses, and educational psychology.

David Faust, PhD, University of Rhode Island, for outstanding contributions in neuropsychology, theory of prediction, forensic psychology and the philosophy of science.

Arthur M. Glenberg, PhD, University of Wisconsin, for outstanding contributions to the study of memory and comprehension.

Thomas E. LeVere, PhD, North Carolina State University, for outstanding contributions to the understanding of recovery of functions after injuries to the brain.

David Madden, PhD, Duke University, for outstanding contributions and systematic studies of attention and memory in the aging.

Thomas O. Nelson, PhD, University of Washington, for outstanding contributions to the study of memory as well as metamemory.

John J. Shaughnessy, PhD, Hope College, for outstanding contributions to understanding the basic features of verbal learning and retention.

APS has grown to a membership numbering over 14,000. Among these are the most prominent psychologists in the discipline. These individuals add to that reputation. It is because of scientists like them that APS has established itself so quickly as the primary voice for scientific psychology.

We offer these new Fellows our sincerest congratulations!

Watch for the November, 1992, *Observer* in which the criteria for APS Fellows status will be published.

People

Kiesler Named Mizzou Chancellor

Charles A. Kiesler, provost and professor of psychology at Vanderbilt University, will become chancellor of the University of Missouri-Columbia, effective November 1, 1992. The appointment was announced in early August by George A. Russell, president of the University of Missouri System.

Kiesler was a key founder of APS and served as the first and only president of the APS predecessor organization, the Assembly of Scientific and Applied Psychology (ASAP). His early efforts in support of scientific psychology were instrumental in the formation of APS.

"With Kiesler's departure, we'll be losing a strong supporter of mental health policy research," said Geogine Pion, an APS Charter Member and research associate professor at Vanderbilt University's Institute for Public Policy Studies.

Russell, who selected the new chancellor "from among four outstanding finalists" interviewed by the Board of Curators in July, said Kiesler was "the right choice among a field of candidates whose extraordinary credentials do great honor to MU, to the UM system, and to the state of Missouri."

Kiesler has distinguished himself as a highly productive scholar and administrator, said Russell. "He is a leader who gets things done and who is willing to make rational decisions and take responsibility for them. His performance as both a scholar and administrator has also earned the respect of those with whom he has worked."

Kiesler, 57, and a native of Missouri, has been in his present position since January, 1985. From 1979 to 1985, he was at Carnegie Mellon University as Walter Van Dyke Bingham Professor of Psychology. He headed the department of psychology

in the early 1980s and served as acting dean in 1981 and 1982 and as dean of the College of Humanities and Social Sciences from 1983 until 1985.

Kiesler was the executive officer of the American Psychological Association from 1975 to 1979. He was professor of psychology at the University of Kansas from 1970 to 1978 and chair of the department of psychology there from 1970 to 1975. He taught at Yale and Ohio State



Kiesler

universities from 1963 to 1970.

He received his bachelor's degree in psychology and Russian, with a minor in mathematics, from Michigan State University in 1958, and his master's degree in psychology with a minor in mathematics, also from Michigan State in 1960. His PhD in social psychology, with a minor in statistics and mathematics, was earned at Stanford University in 1963.

As provost at Vanderbilt, Kiesler is the chief academic officer of the university. Associate and assistant provosts for a variety of other activities including student services, information services and technology and the university library system, also report to him. He is also responsible for academic space and facilities planning, computing, financial aid, promotion and tenure, the registrar, student housing, undergraduate admissions and the university press.

Kiesler is also chair of the Athletic Committee and faculty athletic representative to the Southeastern Conference, the College Football Association and National Collegiate Athletic Association.

Kiesler is widely published and is the recipient of a variety of academic honors, including Phi Kappa Phi, Psi Chi National Scholastic Honorary, and Sigma Xi National Scientific Honorary. He was elected to the Institute of Medicine of the National Academy of Sciences in 1988.

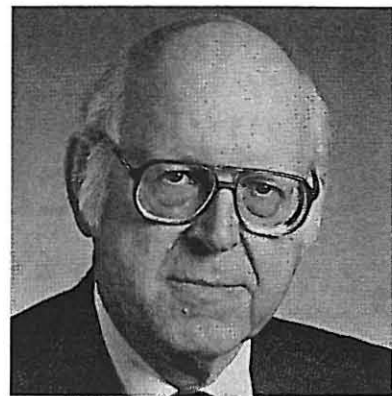
His professional affiliations include membership in the American Association of University Professors, the American Association for the Advancement of Science, the American Psychological Society, the Society of Experimental Social Psychology, Council of Applied Social Research, the International Council of Psychologists, the American Evaluation Association and the Society for Psychotherapy Research.

People News Suggestions Welcomed...

The *Observer* Editor invites readers to submit announcements of noteworthy promotions, appointments, and the like for possible publication in the **People** news section of future *Observer* issues. Send your suggestions to APS *Observer*, 1010 Vermont Ave., NW, Suite 1100, Washington, DC 20005-4907.

Obituary

Computer and Psychological Scientist Allen Newell (1927-1992)



Allen Newell

PITTSBURGH, PENNSYLVANIA—Allen Newell, one of the founders of the fields of artificial intelligence and cognitive science, died early on July 19 at Montefiore Hospital here. He was 65.

Newell earned an international reputation for his pioneering work in artificial intelligence, the theory of human cognition and development of computer software and hardware systems for complex information processing.

In June he was awarded the nation's highest science honor, the National Medal of Science, by President Bush (see story on page 1). Among innumerable other awards, Newell also had been an APS William James Fellow.

Newell's career spanned the entire computer era, which began in the early 1950s. The fields of artificial intelligence and cognitive science grew in part from his idea that computers could process symbols as well as numbers, and if programmed properly would be capable of solving problems in the same way humans do.

In cognitive science, he focused on problem solving and the cognitive architecture that supports intelligent action in humans and machines. In computer science, he worked on areas as diverse as list processing, computer description languages, hypertext systems and psychologically based models of human-computer interaction.

Speaking at a July 27 memorial service, APS Fellow Herbert A. Simon said of his friend and colleague, "From time to time there comes a man or woman who has a dream, a vision; who not only dreams it but gives body to it, brings it to life. Allen Newell was such a man. He had a vision of what human thinking is. He spent his life enlarging that vision, shaping it, materializing it in a sequence of computer programs that exhibited the very intelligence they explained.

"If you asked Allen Newell what he

was, he would say, 'I am a scientist.' He played that role almost every waking hour of every day for nearly half a century. As a great scientist, he was also a great artist, struggling to create form against the severe constraints imposed by nature.

Science is not science fiction. It accepts the tests of observation and experiment, acknowledges the supremacy of fact over wish or hope. The smallest experiment can crash to earth the most attractive theory.

"This is the art Allen Newell practiced: modeling mind, testing his models by experiment and observation, revising them to suit the obdurate facts."

Since the early 1980s, Newell's work has centered on the development of "Soar," an artificially intelligent software system capable of solving problems and learning in ways similar to human beings. The goal of "Soar" is to provide an underlying structure that would enable a computer system to perform a range of cognitive tasks. "Soar" has been in use for the past five years as a framework for several intelligent systems at research institutions around the country.

But Newell knew long before the 1980s what he wanted to pursue in science, according to Simon: "Allen Newell chose for his life work ... explaining the human mind. That choice had already been made when I met him in Santa Monica, early in 1952, and conversed with him as he perched on a desk in RAND's Systems Research Laboratory. In the first ten minutes of our acquaintance I knew his urge to understand the mechanisms of human thought. The great issues that occupied Allen were never held secret long." At a personal level, Simon believed Allen "was trusted, respected and loved because his motives were totally clear. There was no guile in him. Like all of us, he was pleased to be recognized—receiving the National Medal of Science in his last months gave him great satisfac-

tion—but recognition (save the ultimate recognition of his contributions to understanding mind) was not his lodestar. He worked to enable good science to be done. He worked to advance the resources, the effectiveness, the human warmth of the organizations in which he lived."

Commenting on Newell's contribution to cognitive psychology, psychologist David Klahr said of his longtime colleague "I've been thinking a lot about [his] unique influence on cognitive psychology, and on the field's reaction to his contributions. I think I finally understand it. [Newell] did something that made many psychologists uneasy: he took its experimental findings seriously. What do I mean by that? I mean that as a theorist, perhaps the greatest theorist of cognition in the world, [he] looked at the body of accumulated knowledge and he believed the results. He didn't carp about design flaws here, or the wrong statistical analysis there. He took the published record more seriously than many card-carrying experimental psychologists. He believed that the results in the best journals should be accepted, and that they demanded an integrated theoretical account, and that is what he devoted the last 10 years of his life to. That's what Soar is all about."

A native of San Francisco, Newell received a bachelor's degree in physics from Stanford University in 1949. He spent a year at Princeton University doing graduate work in mathematics, and worked for the RAND Corporation as a research scientist from 1950-61. While at

SEE NEWELL ON PAGE 22

The Student Notebook

Dianna Newbern - Editor

New Electronic Network: APSSCnet

APSSC is proud to announce the birth of APSSCnet, an electronic mail bulletin board for students! If you have access to your school mainframe, you can join us in sending and receiving e-mail (electronic mail) to other net subscribers. This free network was established on July 8, 1992, as an efficient means to disperse information regarding APSSC-related activities, business, and services to interested persons.

The 'net' serves as a forum for student discussion of policy and research in the behavioral sciences; as a place to comment on academic, political, or empirical issues; as a clearinghouse for student opportunities such as research, scholarships and funding; and even as a place to advertise for subjects or collaborators in multi-campus studies.

The 'net' is free of charge and open to all students regardless of APSSC affiliation. We expect caucus membership to grow as we all net-work (pun intended!).

How to Subscribe to the Network

To subscribe, send a subscribe command (ADD APSSCNET YourUserID@YourNode YourFirstName YourLastName YourSchool) to the List Server at McGill University (LISTSERV@MCGILL1.BITNET). You may have to replace "ADD" with "SUB" in the subscribe command above.

After successfully sending the List Server subscribe command, you will receive information on the net system and how to use it. If you are not successful, send an e-mail message to APS-AKI@EGO.PSYCH.MCGILL.CA and tell Aki Caramanos (the APSSC manager of the system) you need help. Watch the *Observer* for NETTALK (in this section) for a summary of posting and dialog notes to APSSCnet. We hope you join us in cyberspace!!

NETTALK ...

This is a new section to the Notebook that will contain updates on dialog and postings to APSSCnet, the student caucus-operated electronic mail system. See the article on APSSCnet on this page.

Conversation and postings since the inception of the network a few weeks ago include:

- Questions about the difference between APS and APA student groups
- The APSSC mission statement and bylaws
- Mind/body dualism; cognitive neuroscience; prognoses for repeat child abuse; social psychological aspects of the media coverage of the National Democratic Convention;
- Academic positions and resources for new master's/doctoral degrees.

Want a copy of a document? Call, write, or e-mail APSSC secretary Kathy Morgan (see executive council box this section).

The APS Student Caucus represents all the Society's student affiliates. It is not an honor society. All chapter chairs are additionally recognized as members of the APSSC national Advisory Committee. Students or faculty wanting information about APSSC school chapter applications should contact:

Dianna Newbern
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Fort Worth, TX 76129
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When applying, student chapter founders are asked to provide information about the institution, department, and students, and to designate a faculty sponsor.

A Guide to the Academic Job Search

(This first in a multi-part series will discuss the in's and out's of launching a search for an academic position.)

Part One: Stalking Your Dream Appointment

If this fall is your last, prior to graduation, now is the time to launch your job search for employment to begin *next* fall.

Most academic institutions make hiring decisions about a year in advance of the start date, which means, you have to apply for your dream position at about the time you are preparing for your oral defense—buried up to your neck in data analyses—or burning up the word processor with thesis revisions.

Let's face it, a serious job search takes some work, usually just when you need additional work like you need a hard drive failure! But this series will attempt to reduce the labor by offering some useful advice. You'll learn from new PhDs who have recently taken faculty positions, and tenured faculty who are seasoned members of hiring committees.

Where to Look

"Where do I look for advertised positions?" In the behavioral sciences, several resources are available. These include the *APS Observer Employment Bulletin*, and the *APA Monitor*. Often APA Division newsletters carry ads for positions that might also be advertised elsewhere. The same holds for regional psychology associations. Does your favorite psychological organization have a newsletter at which you rarely have time for a glance? Now is the time to give it a more thorough examination!

Department chairs or program directors occasionally receive announcements of job openings, sometimes prior to their formal publication. Ask your advisor, department head, or program director if s/he receives such materials, and can make them available for your review.

General job announcements can be found for behavioral scientists in *The Chronicle of Higher Education*, a weekly newspaper with a large employment

bulletin section arranged in alphabetical order by field of study. Be sure to search under the name of your subfield as well as under "Psychology," "Behavioral Science," or "Research."

Job advertisements also appear in *Science*. Here one can find ads for faculty appointments, as well as for research assistants and postdoctoral positions. While a majority of these ads are in physical and biological sciences, there are some ads for behavioral science positions as well. Patience and persistence are words to live by through your entire job search experience.

Other places to search are publications by government agencies such as the National Science Foundation (NSF), the National Institute of Mental Health, the National Institutes of Health, and the Department of Defense. NSF, for example, regularly publishes recruitment advertising in the electronic media. To receive postings from NSF, send a message to STISSERV@NSF.BITNET and ask to be subscribed to STSFUL-L@STIS.NSF.GOV. If you do not have access to electronic mail, ask your government documents librarian how you might access this information. If you know faculty members who have outside positions as government or business consultants, ask them about the availability of positions, and how they came to obtain the jobs.

Where to Begin

Review your experiences early on with various faculty members. You want to find three or four, including your dissertation advisor, who can speak directly to your qualifications for an academic job. Discuss your job interests with these people, and ask if they would be willing to write letters of recommendation for you in the months ahead. It is important to ask early since faculty may have scheduled sabbaticals and field research of which you may not be aware. It does no good to count on letters from your favorite statistics professor if s/he is going to be in New Guinea when you need a letter!

Organization

Before beginning the job search in earnest, it pays to get organized. Set up a drawer in a file cabinet to contain all that you need in applying for any position. Keep a file folder full of printer-perfect copies of your current vita, copies of reprints and teaching evaluations. For the latter, be sure to keep a copy of the evaluation form with the final evaluation summaries—this can be helpful to a hiring committee when they are reviewing your materials.

Some institutions will request copies of syllabi for any courses for which you've been a teaching assistant or that you've taught. Keep copies of these in a folder in your "Job Search" file drawer as well. And keep an ample supply of university letterhead, envelopes, and large manila envelopes. The goal is to make it as easy on yourself as possible to assemble an effective and complete application.

When you find an ad that sounds like the position for you, write on it the date and source of the ad, and make a copy (even if you own the publication in which you found the ad) Highlight the due date for application materials. Later, if one of your references asks again for details on the position in order to better tailor his/her letter for you, or if you are called for an interview, it helps to be able to find the original ad quickly.

As you begin to collect ads for positions, have consideration for your references. One of my references wrote one draft of a recommendation letter which he customized as needed. Others, however, wrote each one anew in longhand, which a department secretary then had to transcribe. Don't give your references too many requests for letters all at once. At the same time, try to collect a few to submit at one time so that you are not handing them one every few days.

When you ask for a letter of recommendation, give the recommender a copy of the original job ad with the due date highlighted and any comments that you might have to remind that recommender of experiences or qualities you have that make you perfect for that job. Include a previously addressed, stamped envelope as well. Keep a list of whom you've asked for letters, for which positions, and when you asked. This is extremely useful later when tracking down the inevitable documents missing from application portfolios, or the occasional procrastinating letter-writer. There's lots to do, but following these guidelines will help you ensure your eventual success!

Kathleen Morgan, APSSC Secretary

In the next issue: Crafting Your Application Letter of Interest

APSSC Officers ♦ 1992-1993*

All the officers welcome students and others who wish to contact them about concerns particular to their own offices. Contact Secretary Kathleen Morgan for general inquiries, regional student conference information, and other requests. Correspondence, inquiries, and submissions to the Student Notebook should be directed to Editor Dianna Newbern.

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* The officers listed here reflect election results at the 1992 APSSC annual meeting in San Diego, California. The September Student Notebook will feature background information on each of these newly elected officers.

Organizational Profile

International Behavioral Neuroscience Society

ORIGINS AND PURPOSE

The International Behavioral Neuroscience Society (IBNS) is a new organization founded at its first annual meeting (May 21-24, 1992) in San Antonio, Texas. The Society's by-laws were officially approved by the 151 founding members at the meeting. IBNS is an international, not-for-profit, collegial association of scientists with background/interest in behavioral neuroscience. The Society's purpose is to promote and encourage education and research with respect to behavioral neuroscience. The Society is international in membership and interests; Council members are elected to represent the various international constituencies of the Society and it is expected that annual meetings of the Society will not be restricted to U.S. locations.

MEMBERSHIP

Membership is open to persons who have a demonstrated commitment to promoting and encouraging education and research with respect to behavioral neuroscience. There are two categories of membership: Regular Members are scientists actively engaged in behavioral neuroscience as documented by a significant number of publications in refereed journals; Student Associate Members must have a bachelor's degree, be enrolled full-time in a behavioral neuroscience training program, and wish to participate in Society activities. Regular Member dues: \$40 (US) per year (students \$10). Applicants must be sponsored by two members of the Society and be approved by the Membership Committee and Council. Membership information is available from Linda Spear, Secretary.

The "Organizational Profile," a fairly regular feature of the *APS Observer*, informs the research community about organizations devoted primarily to serving psychological scientists and academics. It is difficult for anyone to keep abreast of the various organizations of potential personal interest. This section should help in that task. The Editor welcomes your suggestions as to organizations warranting coverage.

OFFICERS

Matthew J. Wayner <i>Univ. of Texas-San Antonio</i>	<i>President</i>
Paul R. Sanberg <i>Univ. of South Florida</i>	<i>President-elect</i>
Linda P. Spear <i>Binghamton Univ., SUNY</i>	<i>Secretary</i>
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Yutaka Oomura <i>Nippon Zoki Pharmaceutical Co.</i>	<i>Japan</i>	Annie Morien <i>Texas A&M Univ.</i>	Paul A. Rushing <i>Memphis State Univ.</i>

BACKGROUND

At the first meeting of this Society in May, over 100 papers were presented in general poster sessions as well as paper sessions on each topic theme chosen for this meeting: Obesity, Hunger and Satiety; Peptides, Neurotransmitters and Behavior; and Artificial Tissue Engineering; Neural Transplants, Regeneration and Behavioral Recovery. The second annual meeting will be held April 22-25, 1993, in Clearwater Beach, Florida. Suggestions for symposia and/or topic themes are invited; submit these to either Matthew Wayner, President, or Paul Sanberg, President-elect. For meeting information, contact Linda Spear, Secretary.

The Society's Council will study the possibility of developing and publishing a journal in behavioral neuroscience.

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