A Bit of Luck

by David Riccio

“Better to be lucky than good” is an old saw often mentioned in sports when describing a team’s success (or lack thereof). Hearing the expression this fall (a New England Patriots playoff victory, perhaps?) provided the impetus for reflecting on the happenstance events that facilitated my own career, such as it is. It would appear unseemly, I suppose, for a division president to downplay ability in favor of fortune, but at least in one instance (mine) a case could certainly be made. Just as it is easy to assume that the “biggies” in our business have never received really harsh reviews of their manuscripts (but see Sternberg’s essay on Civility in Reviewing in the January ‘02 issue of the APS Observer for a more accurate picture), success in academia is often attributed solely to an individual’s talents. Let me dispel that notion by reminiscing a bit about times in my own now longish career where Lady Luck was looking over my shoulder.

As a graduate student I thought my interests might be in the areas of social or personality, but a couple of key faculty members either left or went on sabbatical during my first year. So when Professor Byron Campbell (later a President of Division 6 and a Distinguished University Professor at Princeton but then a young Turk striving to establish himself) gave me a big reinforcement for a term paper, my interests quickly shifted. It is doubtful that I would have had much of a career in those other areas, so the switch to Byron’s lab, a mix of substantial freedom to pursue one’s own interests coupled with the rigorous scrutiny of his analytic and sometimes skeptical mind, had a powerful impact on me.

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As the official newsletter of Division 6, BNCP publishes official business, committee reports, news items, job announcements, information on technical issues, topics of current interest, and information about the professional activities of Division 6 members. News items and articles should be submitted to the Editor at the address below (preferably by email). Paid advertisements are not officially endorsed by Division 6. The Editor welcomes comments and suggestions for ways in which BNCP can better serve the needs of the members. The preferred method of submission is by email. Send correspondence and submissions to Stephen B. Fountain via e-mail at sfountai@kent.edu. Postal mail should be sent to Stephen B. Fountain, Department of Psychology, Kent State University, Kent, OH 44242-0001. Other contact information: Phone: (330) 672-3826; FAX: (330) 672-3786

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WHY SHOULD YOU BELONG TO APA?

by Philip G. Zimbardo, Ph.D.
President of APA

One of the first things that newly-elected APA Presidents do is get briefed by staff on the structure, function and activities of APA’s organization and its members. When I first became President I knew about as much about APA as the typical member -- I subscribed to the journals, I read parts of the Monitor, gave talks at conventions, and I knew that there was a large organization "somewhere" doing things in support of Psychology. Unlike most APA presidents, I was a total outsider to APA governance, never having had anything to do with its Council of Representatives, task forces or many committees. I paid my dues, used APA when I needed to, but never worked in its trenches. I won the election based on solely on the credits I had earned as an academic-scientist.

Now that I am well into my Presidency, I can say it has been an eye opener for me to discover the range, number and extent of projects, task forces, actions and initiatives meant to further our discipline, advocate for psychological science, and apply psychological knowledge in the service of society. I also had no idea of the large staff infrastructure at APA that serves as our eyes, ears, hands and feet in making sure that psychology gets funded and represented at federal and local levels, in making sure that the very best of science, application and practice come to the attention of policy makers and implementers, and in fostering psychology’s collaborations with other scientific disciplines.

I realize I may sound like a cult convert, but I want to share with my colleagues in Division 6 a few of the things that I’ve learned that APA does for its scientists and scientist-practitioners. I hope it will help dispel the myth that "APA does nothing for scientists or academics," or "my dues go only to support Practice." The more I have learned, the more I have
Once again I had a stimulating time at the February Council meeting in Washington, DC. There is something about a meeting of about 150 top-notch psychologists working on problems that are mostly common to all of us that is invigorating. Although different members of council have different agendas, we are basically all interested in behavior and are thoughtful in how we attack our problems. If one wanted to only consider the basic research that was discussed, there was little in this year’s agenda that was directly related. But if one wants to think of the bigger picture, then there was much of interest. One optimistic thing that I see evolving is more desire on the part of clinical psychologists to have research as the foundation of their practice. This is not true of all of them, but it is true of many as I heard expressed in caucus meetings and in private conversations.

I attended three caucus meetings: CASAP (Coalition for Academic, Scientific, and Applied Psychology), Women’s Caucus, and a new caucus on Health Psychology. All were well attended and there were important discussions for the future of APA at each of them.

1. **CASAP** is the caucus of and for science and academia (I am secretary-treasurer). Although there was little at this council meeting that is directly relevant to science, there was strong representation at this meeting. It is this group that has asked for nominations from our division for APA Boards and Committees (with Bill Howell as the chair of the committee). This project has proved to be very successful. Sixteen of the 21 slates included candidates recommended by CASAP. At this meeting it was decided to support the candidacy for five people for APA President without ranking them. In alphabetical order, these are:

   a. **Linda Bartoshuk** — [http://www.tastelab.org/index.php3](http://www.tastelab.org/index.php3) — a leading taste researcher at Yale. She has served on NIH and APA committees, including presently on the Board of Scientific Affairs as well as being a past-president of Div. 6 — she would be outstanding.

   b. **James Bray**

   c. **Morton Gernsbacher** — [http://psych.wisc.edu/lang/MGcover.html](http://psych.wisc.edu/lang/MGcover.html) — established the language comprehension lab at Wisconsin and is currently Chair of the Board of Scientific Affairs of APA

   d. **Diane Halpern** — California State University in San Bernardino; expert on gender differences in cognitive abilities

   e. **Colin Martindale** — cognitive & neural network theory at U of Maine.

I urge you all to nominate those of these individuals that you may wish to support. With your help, we will have a full slate of candidates on the ballot (those people with the most nominations are the ones who are listed on the ballot). As you know, our efforts last year were successful with the election of Bob Sternberg as president-elect and Bruce Overmier to the Board of Directors.

2. **The Women’s Caucus** provided another format for the presidential candidates to speak—all of three minutes each. Not surprisingly, the agenda of this caucus is to foster an increase of women in governance, and to help to insure equal opportunity for women in all phases of psychology. This group also voted to support the candidacy of Linda Bartoshuk as well as two women practice candidates. Membership in this caucus is $25 if paid by the individual and $50 if paid by the division or association. I am a member of this caucus also.

3. **The caucus of Health Psychology** is a new caucus founded at this meeting to continue the work begun last year by Norine Johnson (now past-president). The meeting was mainly organizational. The goal is to stress the role of psychology in...
Continued from “Cheal,” page 3

all areas of health, from basic research to applied research, to education of our psychology students and to the public at large, and to the practice of psychology. This caucus may be very important for some members of our division. Please contact me if you see areas of concern that I can bring to the group.

A report on an Inter-Directorate Health Coordinating Group that met in November was given. This group pooled ideas on health psychology from the three directorates. The Science Directorate reported two pages of activities that show how the directorate is working on health related issues. In that most, if not all, health issues are related to behavior in one way or another, it is obvious why psychologists would be interested in health issues. It appears that there will be good funding for health psychology, so you may want to consider this as you make your own research plans.

The first meeting of the entire council was on Thursday afternoon, the Candidate’s Forum. There were brief presentations by those presidential candidates who were present (Linda Bartoshuk, and James Bray who would be considered to be more academic than science).

This Forum was followed by the Plenary Session. President Phil Zimbardo, reported on his initiatives. One of these (Psychology Makes a Difference) is the compilation of a list of research that has led to important applications. His survey form of how to include your own work can be found at: http://research.apa.org/survey/compendium. Do complete this form before March 23, 2002, if you have published such research.

On Friday and Saturday, we worked on the agenda and had some specific presentations. One of the presentations was on the changing demographics in the US presented by a representative of the U.S. Census Bureau. Discussion followed of how the changing demographics (changes in minorities, increased population outside of large metropolitan areas, etc.) affect psychology. It was suggested that it was especially important now to include groups that represent various ethnicities, both genders, and aging populations in research with human participants.

On a more somber side, APA is experiencing financial difficulties. This does not mean that we are broke…far from it. But the cash flow was badly hit after the September 11th disaster, and further suffers from the change in association demographics. More members are reaching the dues-reduced age, and membership has not grown as one might hope. It was voted to hold spending to current levels rather than to try to raise any additional funds, unless a new way of raising money is found.

The financial problems may be compounded because Ray Fowler is resigning as CEO of APA. A search for his replacement is being conducted. However, finding a good replacement may also impact the budget.

Encouragingly, the number of APAGS members (APA graduate students) is large and active. One consideration presently being considered by council is whether to have a voting APAGS member on council. There are two sides to this question: on the one hand, future membership wants to be encouraged and the ideas of the graduate students are very valuable; on the other hand, there is some concern to opening APA membership to non-PhD level persons. The decision will come at a later meeting.

Some Actions of Council

1. A resolution on ageism was passed. This resolution states in part, “…the American Psychological Association rejects ageism in all its forms and is committed to support efforts to eliminate it from our society.”

2. Funds were approved for a membership recruitment and retention fund for 2002.

3. APA will fund one, two-day meeting of the Task Force on Psychological Testing on the Internet to be held in 2002.

4. As you know, there will be a new format for APA in August. Evaluation by a committee of council will be postponed until after the 2003 convention in order to provide a better opportunity to test the new plan.

5. There will be no plan to change the dues structure of APA at this time.

There was little disagreement on these or other agenda items and it looked as if we would finish on Saturday. This was of no use to those of us with airline reservations locked in, and one forward-looking member suggested we use the time available for council to generate ideas for APA. On Sunday morning, we divided into four groups that discussed: a) the influence of psychology, b) diversity, c) science and academia, or d) future ideas for APA. The group for science and academia consisted of mainly science and academic psychologists, so I decided to be sure that science was represented in the group on the future of APA. I did not take notes but found that many great ideas were presented. Notes from each discussion were given to staff, who will type and distribute them. Each group was to generate action items for council so hopefully something useful will result.
Convention 2002*.

The convention this year will be held in Chicago. It will run from Thursday through Sunday, and most events will be held at the McCormick Place Conference Center. Division 6 meetings will be in one of two hotels. Unfortunately, these hotels are a long way apart...the McCormick Place Hotel, which is near 23rd Street and the Conference Center, and the Hilton Chicago, which is near 8th Street...a long walk I fear. The program looks outstanding from the plenary programs, such as the keynote address with Studs Terkle at the opening session. Also, on Thursday night, August 22, you may go to THE SECOND CITY, Chicago's famous improv group. The cost is $35 per person with dessert and coffee included and will benefit APA's Public Education Campaign. My guess is that the tickets will go quickly so I suggest you get yours early. The information will probably be in the March, American Psychologist. The parts of the cluster and division programs with which I am familiar are very strong. Our cluster has great symposia and the entire program of Division 1 looks good. You will hear more about the Division 6 program from Roger Mellgren. So, I will see you in Chicago!

A three year Army tour of duty that I thought would involve going to Walter Reed Army Institute to work with Dr. Joe Brady became an assignment as an ambulance platoon leader in Ft. Knox, KY (bad luck). However, a special opportunity to switch to the Navy (good luck), where I was assigned to the Naval Aerospace Medical Institute in Pensacola, gave me experience with operant techniques (preparing squirrel monkeys for a biosatellite project) and with developing behavioral ways to assess motion sickness in a non-vomiting species, the rat.

In contrast to the present academic environment, where we expect job candidates to have a full-fledged program of research ready to launch, my own plans when interviewed at Kent State U were pretty hazy, I'm sure—probably something like "I hope to run some experiments with rats". So I am lucky that I even got the job, especially as Kent proved to be the right niche for me.

Federal grants were handled on a more casual basis back in my "early years". I owe the first entirely to good fortune. In response to my phone inquiry, the Executive Secretary (as SRA's were then known) indicated that my grant would be funded, so when an "approved but not funded" letter arrived I put in another (anguished) phone call. The Executive Secretary remembered our earlier chat and, since I was on the cusp, agreed to provide the money from his discretionary pool. I hope that incident is not the reason the system changed, but certainly my fledgling career benefited from that casual arrangement!

At least two review papers were generated from lucky circumstances. One came about because a sharp graduate student, Debbie Ebner, asked me a "simple" question about an apparent contradiction in the literature. I quickly began to show her the "error" of her understanding until it dawned on me that she was quite correct. Some 20 years later, I am still trying to resolve the paradox that she identified (Riccio, Richardson and Ebner, 1984; Riccio, Richardson and Ebner, 1999). The other paper can be attributed to fortuitous seating on a long flight to an APA meeting in San Francisco. It happened that my seatmate, Vita C. Rabinowitz, a Social Psychologist at CUNY Hunter College, was at least as chatty as I, so we passed the time discussing our respective research interests as well as discovering that we had friends in common. By the time the plane touched down the idea of trying to explore the implications of a well known animal learning principle, namely, the flattening of stimulus generalization gradients over time, to an array of phenomena in social, cognitive and clinical areas had taken hold. With the help of email and express mail we completed the exercise a few years later (Riccio, Rabinowitz, and Axelrod, 1994)

I had originally intended this message as a form of encouragement to junior colleagues getting started, but I realize that describing the importance of luck is hardly akin to useful advice. Perhaps the best I can do is say when fortune smiles, take advantage!

BNCP back issues are available online at http://www.apa.org/divisions/div6/newsletter.html
Behavioral Neuroscience and Comparative Psychology
Division 6 Program for APA 2002

THURSDAY, AUGUST 22, 2002

Invited Address
10:00 AM - 10:50 AM, McCormick Place South Building-Level 5, Meeting Room S504d
   Roger K.R. Thompson, PhD, Chair
My Life With Mozart’s Starling
   Meredith West, PhD

FRIDAY, AUGUST 23, 2002

Symposium: Retrospective Revaluation—Learning Without Input? I
9:00 AM - 10:50 AM, McCormick Place South Building-Level 5, Meeting Room S501bc
   Ralph R. Miller, PhD, Chair
Introduction
   Ralph R. Miller, PhD
Much Ado About Nothing: Reassessing Absent Stimuli in Causal Learning
   Edward Wasserman, PhD
Associative Mechanisms of Retrospective Revaluation
   Anthony Dickinson, PhD
Higher-Order Retrospective Revaluation
   Jan De Houwer, PhD

Symposium: Retrospective Revaluation—Learning Without Input? II
11:00 AM - 11:50 AM, McCormick Place South Building-Level 5, Meeting Room S501d
   Ralph R. Miller, PhD, Chair
Contrasting Acquisition-Focused and Performance-Focused Models of Retrospective Revaluation
   Ralph R. Miller, PhD
Retrospective Revaluation of Attentional Strengths (As Distinction From Associative Weights)
   John K. Kruschke, PhD

Poster Session
1:00 PM - 2:50 PM, McCormick Place Lakeside Center-Level 3, Hall D1
Quantifying Kin Recognition and Phenotype Matching in Spiny Mice
   Richard L. Deni, PhD
Sickness Behavior: Post-Tolerance Sensitization and Tolerance Disruption
   Julie K. Cremeans-Smith, MA
Indices of Energy Expenditure and Leptin
   Mary A. Nies, PhD
Explanation of Psychoanalytic Behaviors by Neural Networks and Dynamical Systems
   Mitsuo Takase, BA

Executive Committee Meeting
6:00 PM - 7:50 PM, Hyatt Regency McCormick Place Hotel Hotel-Second Floor, Board Room 1
SATURDAY, AUGUST 24, 2002

New Fellows Address
1:00 PM - 1:50 PM, McCormick Place Lakeside Center-Level 2, Meeting Room E263
   John F. Disterhoft, PhD, Chair
   Functional Neuroanatomy of Implicit and Explicit Memory During Fear Conditioning
      Fred J. Helmstetter, PhD

New Fellows Address
2:00 PM - 2:50 PM, McCormick Place Lakeside Center-Level 2, Meeting Room E263
   David Riccio, PhD, Chair
   Memory Measurement and Screening for Memory Impairment to Detect Dementia
      Herman Bushke, MD

Presidential Address
4:00 PM - 4:50 PM, McCormick Place Lakeside Center-Level 2, Meeting Room E260
Retrograde Amnesia: Recovery, Reconsolidation, and Retrieval
   David Riccio, PhD

Business Meeting
5:00 PM - 5:50 PM, McCormick Place Lakeside Center-Level 2, Meeting Room E260

SUNDAY, AUGUST 25, 2002

Symposium: Comparative Psychology Across the Globe—The United States, Japan, and Scotland
9:00 AM - 10:50 AM, McCormick Place South Building-Level 5, Meeting Room S501a
   Gary Greenberg, PhD, Chair
   Salience of Stimulus Events As a Parameter of Learning
      Duane M. Rumbaugh, PhD
   Studies of the Chimpanzee Mind in Lab and Field
      Tetsuro Matsuzawa, PhD
   Environmental Enrichment for Poultry Well-Being
      R. Bryan Jones, PhD
      Jeannette Ward, PhD

Invited Address
11:00 AM - 11:50 AM, McCormick Place South Building-Level 5, Meeting Room S503a
   Gary Greenberg, PhD, Chair
   Two Advances: Drosophila Trait Dissection and Understanding Human Individuality
      Jerry Hirsch, PhD
been motivated to contribute time, energy and talents to further these important efforts (as I will outline at the end of this note). If you want to know the whole gamut of things the Science Directorate does, please check out its web page -- www.apa.org/science.

Here are a few highlights in just three areas -- advocacy, training, and what I will call "burning issues." These activities underscore what APA does "behind the scenes" in service to us all.

**Advocacy:** You probably all know that APA has a large presence on Capitol Hill through its activism for mental health parity and prescription privileges. But did you know that APA has an equally vocal presence for science matters? APA staffers monitor what is happening on the Hill and in Federal Agencies relevant to researchers (NSF and NIH -- including institutes NIMH, NICHD, NCI, NINDS, NIDA, NIAAA, NIA; and VA, NASA, DOE, DoD, and FDA to name a few -- a lot of alphabet soup, but rich in funds that we want to tap into). They work in many ways to advocate for behavioral science funding, and for report language in federal bills in support of behavioral science research – by proposing legislative language, by testifying before congressional committees, and by visiting with congressional members and their staff. Much of this work is done in coalitions, and APA’s staffers take leading roles. Just for starters, PPO-Science’s Karen Studwell chairs the Friends of The NICHD (a coalition that advocates for the National Institute of Child Health and Human Development), PPO-Science’s Director Geoff Mumford is the treasurer of the Coalition for National Science Funding, PPO-Science’s Heather Kelly is the treasurer of the Defense Research Coalition, and PPO-Science’s Pat Kobor is co-chair for the Coalition for the Advancement of Health through Behavioral and Social Sciences Research. In addition to "lobbying" efforts, APA staff continually monitor and respond to doings in the federal research and regulation arena. Whenever there are requests for comment on proposed regulations or changes to the research landscape, staff request input from relevant experts and draft a comment or letter from APA. In the last year APA has made comments on a wide variety of proposed legislative and regulative issues from education, animal research, medical records privacy, data sharing, to standards for IRB accreditation. For each of these issues, members have been asked for their input – to make comments on written documents, to come to Washington to help put on congressional events, such as briefings or research exhibits, or to let APA take them to talk directly to their congressional representatives on the Hill about specific legislative issues. You can find out about these by subscribing to a monthly e-newsletter that will keep you up to date – its called SPIN. Look at it via http://www.apa.org/ppp/ issues/spinhome.html or sign up by sending an email to ppo@apa.org

APA also advocates in a different way -- there is regular APA representation at major meetings of other societies and organizations (e.g., Society for Neuroscience, American Association for the Advancement of Science, National Academies of Science, etc.), where larger science initiatives and issues are discussed. In these venues APA presents information on such issues as ethics, research regulation and IRBs, or gives comments to National Research Council committees on their scope and work plans. APA has an important place at the science table -- I attend a bi-annual conference of the presidents of over 60 scientific societies, where psychology is the only social/behavioral science represented, and have been able to show these physicists, biologists and others of the many ways in which psychology is relevant to issues of national defense, terrorism, and more. APA staff also attend regular meetings with other science groups and with policy makers (for example the Office of Science and Technology Policy -- the white house’s advisory arm) to discuss current science opportunities and issues, and consult with federal agencies on applications of behavioral research to their concerns.

**Training:** APA’s most visible student activities occur through its graduate student association, APAGS -- but did you know that the Science Directorate sponsors the "Science Student Council" -- a group of 10 students who engage other science graduate students in convention programming, an extensive web presence, an email network, a grant program and more? The Science Directorate is also involved in some direct training activities. One activity is for more established researchers -- the Science Directorate’s "Advanced Training Institutes," first held in 1999, offer week-long, hands-on courses on cutting-edge methodologies such as fMRI techniques or longitudinal modeling. Another activity is directed toward advanced graduate students and young faculty, the Academic Career Workshop. This workshop, which delves into the nitty gritty of finding, getting and keeping an academic research position, has been offered for several years at convention and at smaller scientific meetings. APA offers many more opportunities for learning -- from teaching tips for faculty, to a week course on psychology in general for outstanding science undergraduates, to the Exploring Behavior Week outreach to high school students. I will add that each of these activities is something in which
you or your students could participate. I am planning to have APA develop the standard text for H.S. psychology courses, to collaborate with APS in promoting psychology science at H.S. science fairs, and to develop new web sites for training H.S. and College teachers in being more effective in their teaching.

"Burning Issues" Activities: You may know about APA's standard governance groups -- the Board of Scientific Affairs (BSA) consists of 9 outstanding scientists (current Chair is Harry Reis, Div 8 Executive Officer), and its three standing Committees, CPTA (Committee on Psychological Tests and Assessments), CARE (Committee on Animal Research & Ethics) and COSA (Committee on Scientific Awards). But you may not know that BSA regularly supports the establishment of working groups or task forces that address timely issues. Recent ones are a working group on Internet research, a task force on testing on the Internet, and a working group on the implications of the genetic revolution for psychological research and knowledge, and an ad hoc group to address current issues in research regulation, especially IRB activities. Each of these groups, comprised of experts in the topics, has been called together to survey the issues and make recommendations about what to do next. For example, the research on the Internet group (chaired by Robert Kraut) is looking at technical, ethical, and other implications of using the internet as a tool for collecting data, as a means of assistance to researchers who are or intend to use this tool. The IRB group is planning to develop informational materials to facilitate IRB-researcher-administration interaction.

I could continue this list of things the science directorate and APA do for social psychologists and social psychology -- I have not even mentioned their regular activities that support the field such as research based awards, student grants, conference awards, and more, that demonstrate that APA respects and supports its scientific foundation. But there is a more important point that I would like to address. This is the perception that APA does nothing and what you can do about it. When I mentioned this perception to Science Directorate staff (headed by Dr. Kurt Salzinger), they said it was something they constantly worry about -- and wondered how much their regular efforts - - substantial communications such as, Psychological Science Agenda, the bi-monthly newsletter; listserv notes; and the Science sections in the monthly Monitor -- get read or noticed by colleagues. Only you can answer that one -- but I want to remind you that the marvelous activities APA does in support of science are only possible when members (that is YOU!) are generous with their time, effort and attention. In each of their activities, the Science Directorate draws on member expertise, ideas and enthusiasm. So when you read a call for comments on your Division listserv, or read about a new important issue for which APA might be active, know that your input, your response and your opinion are not only important, they are the heart of what APA is all about. I want to assure you that there are eager ears waiting to hear from you -- mine, Bob Sternberg's (APA's president elect who will carry on the scientific tradition), and the staff of the Science Directorate.

Finally, let me mention a few things that I will be focusing on during my presidential tenure, in addition to helping develop a H.S. text and Psychology Science Fairs. I am working with the heads of APS to find areas in which our organizations can meaningfully collaborate for the benefit of psychological science. I am advancing an initiative to develop a compendium of all research psychologists have done that demonstrates a significant difference in improving some aspect of our lives, individually or collectively. Data are coming in from this survey (to which I would like each of you to contribute, see http://research.apa.org/survey/compendium/). When collated and organized by a task force of our experts, this compendium will be invaluable for creating a more positive image of psychology to Congress, the media and to the public.

I hope this quick overview has been of some value to you and encourages you to continue your APA membership, join if you are not, and promote APA to your students. One last word, the Chicago Convention (Aug 22-25) will be the best ever, in part because I am working closely with the Board of Convention Affairs to have many new, amazing features, fabulous events, special guests with fun and good times and rock and roll for all.
Looking at Violence, from Animal Models to Studies with Humans

Today more than ever, violence and threats of violence are a primary concern for a majority of people in America and around the world. The effective prevention of future disasters requires a better understanding of the factors influencing aggressive and violent behavior. My research is focused on the effects of stress, particularly social stress (such as bullying), on the development of aggressive and violent behavior and its underlying neurobiology during adolescence. This developmental period is critical in humans. A number of studies and tragic events have recently shown the vulnerability of adolescents to social stress and, in particular, bullying. Although my studies have been primarily directed at the development of animal models, I am also interested to test human subjects. One purpose for animal models is the development of testable hypotheses for studying human subjects.

Aggressive behavior can be studied in a laboratory as either offensive or defensive aggression (i.e., initiation of attacks vs fighting back). Offensive aggression is best studied in a laboratory with a resident-intruder model. In this model, resident animals initiate attacks toward smaller and younger intruders. Offensive aggression can be easily studied with golden hamsters, as males readily attack intruders placed in their home cage. The neurobiology of offensive aggression is well developed in this species. The behavior is facilitated by vasopressin and inhibited by serotonin injected within the anterior hypothalamus. The same neurotransmitters have also been involved in the control of aggressive behavior in other species, including humans.

As we have developed a significant body of data on the neurobiology of aggression in hamsters, it became interesting to determine the role, if any, of environmental variables occurring during development and their effect on aggressive behavior and its underlying neurobiology. One such variable is stress caused by exposure to aggressive individuals. As young males become independent they are likely to enter the territory of older and aggressive individuals. Our studies showed that social experience during development affects offensive aggression and the expression of serotonin and vasopressin inside the anterior hypothalamus. In male hamsters, repeated exposure to an aggressive adult during adolescent development resulted in a context-dependent alteration in aggressive behavior. Previously subjugated animals were less likely to attack intruders of similar size and age, while more likely to attack smaller and younger individuals.

Neurobiological changes were also reported in these animals. Previously subjugated animals had increased serotonin innervation and decreased vasopressin content in the anterior hypothalamus. These neurobiological changes were consistent with the function of the two neurotransmitters on the control of aggression in the context of decreased aggression toward individuals of equal size and age. However, these neurobiological alterations did not correlate with the increased aggression in the presence of a smaller intruder. One possible explanation is that other neurotransmitters have to be explored, particularly within additional areas of the brain involved in the control of offensive aggression.

Because these effects have a strong developmental component, we decided to look at the development of offensive aggression in socially subjugated individuals. In hamsters, offensive responses toward intruders develop from play fighting behavior into adult aggressive responses. Play-fighting behavior peaks during adolescence around postnatal day 35. Adult offensive responses become fully established by postnatal day 65, at which time play fighting behavior disappears. Two characteristics differentiate the agonistic behavior of juveniles and adults. First, play-fighting offensive responses are
characterized by attacks targeting the face and cheeks of the intruder. In contrast, adult offensive responses are characterized by attacks targeted at the lower belly and rump. Second, the frequency of attacks changes during development, peaking during the play-fighting period, and decreasing toward adulthood. During a new set of experiments, males were repeatedly exposed to aggressive males during the play-fighting period, and these animals were tested for offensive behavior at specific intervals during development. In these new experiments, we were wondering how repeated exposure to aggressive adults alters the development of these two characteristics. Our results show that repeated exposure to aggressive males accelerated the development of the type of aggressive responding in hamsters. By postnatal day 45, socially subjugated animals performed mostly adult-like aggressive responses as compared to their controls. A different effect was observed on the changes in frequency of attacks. The overall developmental changes in frequency were not altered in socially subjugated animals. However, we observed that subjugated animals retained a higher level of aggressive activity into adulthood. These behavioral changes were associated with enhanced expression of tyrosine hydroxylase, a critical enzyme in the synthesis of dopamine within the medial amygdala and bed nucleus of the stria terminalis, areas connected to the anterior hypothalamus and also involved in the control of offensive aggression in hamsters.

These new findings are interesting as they show a correlation between the development of aggressive behavior and dopamine neurons within the brain. Activation of dopamine receptors within the brain has been associated with aggressive behavior in a few studies. Exposure to cocaine during adolescent development enhances aggressive behavior in hamsters. However, the location of the dopamine neurons and dopamine-responsive neurons involved in the behavior is still unclear. It is possible that populations of dopamine neurons uncovered in our studies play a critical role in the development of offensive aggression. It is also possible that repeated stress during puberty alters the development of dopamine neurons within the brain resulting in an abnormal development of aggressive behavior. These possibilities will be addressed in future studies.

It would be interesting to broaden the scope of these studies. Are the behavioral alterations caused by repeated exposure to social stress limited to the development of aggressive behavior, or can they also alter other behaviors, such as impulsive behavior or addictive behavior? Are the changes observed in the brain limited to dopamine neurons or more generalized as part of a main developmental mechanism, such as puberty? Are these effects specific of social stress or can they be caused by other stressors? How about females? Can similar or related observations be made in females? Most of these questions are still in the planning phase. Some pilot studies were recently performed with females. Females were found to have different time-course in the development of aggressive responding. It is still unclear whether this development is altered by repeated stress in females.

Finally, as noted above, I am interested in this animal model as a way to produce testable hypotheses for studying human subjects. For instance, we are currently testing a hypothesis derived from the data presented above. We hypothesized that bullying alters the development of concepts of violence in adolescents, therefore increasing the likelihood that adolescents would use lethal violence to settle disputes or avenge themselves from bullies, as recently observed in high schools across America. A first study was designed in collaboration with a colleague for the Developmental Psychology area at the University of Texas, George Holden. The data were collected from surveys administered to undergraduate students. The results were encouraging. We observed several differences between bullied and non-bullied students. In particular, we noted that previously bullied students were more likely to see lethal violence as a norm for 18-years old individuals. This study included female individuals as well. To our surprised, we noted that bullied females had unique behavioral features. Of course, these data are mostly correlational. This study will have to be replicated and we will need to establish a longitudinal approach. However, the existence of an animal model will also be very useful to test some of the results obtained from this study. Some of the observations noted with female students are now being tested in hamsters.

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