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Brain Art: Blind Researchers and the Pathologic Brain
By Dr. Zhi-De Deng

Co-Editors Welcome to the Next NAN Bulletin
By Lana Harder and Shawn M. McClintock

Women in Science: The Current State of Affairs
By Drs. Heidi Rossetti, Nyaz Didehbani, and Jennifer Peraza

Managing Student Loans in Postdoctoral Fellowship and Beyond
By Drs. Jonathan Grabyan and Victor Del Bene

Financing Graduate School
By John Bernstein

Language in Neuropsychology Part 1: Linguistic Diversity and Determining Assessment Language
By Drs. David Gonzalez, Audrina Mullane, Lawrence Pick, and Adriana Macias Strutt

Crossword Puzzle Time: People and Places

"Don’t Set Out on a Journey with Someone Else’s Donkey": Enculturation and the Neuropsychological Assessment of African Immigrants
By Drs. Anthony Stringer and Jean Ikanga

On the COVER

Zhi-De Deng, Ph.D.
Staff Scientist, Director of Computational Neurostimulation Research Program
Noninvasive Neuromodulation Unit
Experimental Therapeutics & Pathophysiology Branch
National Institute of Mental Health, National Institutes of Health

Title: Blind Researchers and the Pathologic Brain

Description: This piece is a parody on the ancient parable of the Blind Men and the Elephant: a group of blind men who have never come across an elephant before attempts to conceptualize what an elephant is like by touching it. Each man feels a different part of the elephant’s body and describes the elephant based on their different and limited perspectives. One touches the tail and concludes that the elephant is like a rope; one hugs the elephant leg and says the elephant is like a tree-trunk; yet another feels the tusk and states the elephant is like a spear. And so are our perspectives of the pathologic brain, conclusions based on the study of a narrow set of abnormal features often lead us to biases and a lack of general objectivity.

Medium: A structural brain MRI (actually it was MRI of Dr. Deng’s head) was segmented in MATLAB. The surface rendering of the cortex was exported and made into stylized line drawing in Photoshop. Finally, other elements were assembled with Illustrator.
Dear Friends,

It has been a while since our first issue of the Bulletin was released and our world seems quite different since that time. Indeed, in response to the COVID-19 pandemic that has engulfed the globe, the world has come to a halt in many respects, and in other ways, the world has opened up with new opportunities and possibilities. Many of us may be developing new ways of serving our patients remotely and creating tools for long-term use even when our need to practice social distancing is over. Many are asking and pondering all sorts of questions such as When will I be back in the office?; What will tomorrow bring?; Will I continue to engage in telehealth?; and What will a new normal look like? While we don’t have those answers just yet, we are glad to provide y’all with a new issue of the Bulletin.

We have continued to remodel the Bulletin making it more accessible and approachable to a wide audience. The written pieces were and are from multiple voices that span from students to senior colleagues, professionals across the globe, and a future issue will even include an article by a New York Times Best Selling Author. Who you may ask? You’ll find out soon enough so long as you read the Bulletin!

We envision the Bulletin as a go-to publication for contemporary issues and hot topics in brain health and science, student and early career training, inclusion and diversity, and brain games, with original works of brain art! So, in this issue, get ready to read about topics including women in science and the National Institutes of Health Director’s pledge to advance gender equality at scientific conferences, clinical neuropsychology practice with diverse populations, financial management, and advancing research and clinical practice across the globe. Plus, test your knowledge with the Bulletin’s first crossword puzzle.

During this time, we hope you enjoy the exciting articles and crossword puzzle in the Bulletin. And as always, we would love to hear your feedback.

Sending wishes for safety, good health, and wellness!

Lana and Shawn
Co-Editors, NAN Bulletin

Opinions expressed by the authors and advertisers do not necessarily reflect the position of the National Academy of Neuropsychology.

Now available - a variety of educational webinars exclusively for trainee members, included within the annual membership fee. In collaboration with leaders in the field, the webinars are specific to the needs and interests of trainees. These webinars can be used to enhance or supplement graduate education, and are available for streaming through the NAN NeuroNetwork online community under member resources.

- So You Want To Be a Research Mentor by Dr. Amy Jak, Ph.D.
- Financial Considerations by Beth Arredondo, Ph.D., ABPP
- Entrepreneurship and Neuropsychology: Essential Information for Starting, Growing & Maintaining a Private Practice by Chriselyn Tussey, Psy.D., ABPP**
- Succeeding in the Early Career Phase: From Postdoctoral Fellow to Professional by Shawn McClintock, Ph.D., MSCS**
- Neuropsychology Supervision: An Individual Approach to Clinical Training by Mark Jacobson, Ph.D.

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Women in science, including clinical neuropsychology, continue to rise in number, diversity, achievement, recognition, and leadership representation. However, within this evolution, there remain complex, nuanced challenges and obstacles, both tangible and intangible, to gender equality. As we keenly observe and monitor the trends, setbacks, and successes in our professional setting, country, and world at large, the information below offers a brief snapshot of the current state of affairs for women across science, including interesting trends, outstanding contributions, and teachable moments that highlight the need for further growth. We conclude with a host of resources and materials for interested readers to enhance the understanding of this topic, educate others, and provide useful support where needed.

Current Trends: The State of Affairs for Women in Science

- **Less than 30% of the world’s researchers are women.**
- **Women earned 57% of bachelor’s degree across all fields with 50% in science and engineering in 2013. However, women are underrepresented in computer science (18%), engineering (19%), and physical sciences (39%).**
- **Women in science and engineering professions have increased from 23% in 1993 to 28% in 2010 with the largest increase in biological and related sciences doubling to 48%**.
- **Overall, there has been an increase in science and engineering occupations from 5 to 19 million; nonetheless, women remain underrepresented in high tech, engineering, and physical science employment positions.**
- **Women are less likely to enter Science, Technology, Engineering and Math (STEM) careers, but more likely to leave. Fifty-three percent of women in business roles in tech companies leave to go to other companies compared to 31% of males.** The leave rates for women in science, engineering, and technology peak around 10 years into their careers with approximately 1/3 of women in the US planning to leave their job within one year. A number of factors have influenced the decision to leave including difficult male-dominated environments, isolation, and lack of sponsors.
- **Women on average were paid 78% of men’s annual median earning in 2016 in STEM-related jobs. The gender pay gap actually widens when women have more education. According to the United States Census Bureau, among workers with a bachelor’s degree, women earn 74 cents for every dollar that men make, compared to 78 cents for those without a bachelor’s degree. Proposed reasons for this include systemic discrimination, the so-called ‘motherhood penalty,’ and occupational segregation, in which women are being steered into lower-paying occupations or lower-paying subsets of high-paying occupations.**
- **A win for gender parity! In June 2019, the Director of the U.S. National Institutes of Health (NIH), Dr. Francis Collins, made an online statement that it is time to break the tradition of all-male panels at scientific conferences, and he is going to do his part by declining to speak at conferences if “attention to inclusiveness is not evident in the agenda.” Recently, the Directors of the National Institute on Aging (NIA) and the National Institute of Mental Health (NIMH) both agreed with Dr. Collins’ statement. Organizations like Bias Watch Neuro (biaswatchneuro.com) and Gender Avenger (genderavenger.com) monitor scientific conferences to track the ratio of men and women presenters and promote social awareness of gender disparities. Men can follow Dr. Collins’ lead and make a public online pledge that they will not serve as a panelist at a public conference when there are no women on the panel.**
Percent of Women in STEM professions:

<table>
<thead>
<tr>
<th>Profession</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace engineers</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Computer network architects</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Physicists and Astronomers</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineers</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>Environmental engineers</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Chemists</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Social scientists</td>
<td>63%</td>
<td></td>
</tr>
</tbody>
</table>

STEM Occupations by degree and sex: from the National Science Foundation 2010

SPOTLIGHT ON Recent Female Contributions to Science

First Woman Wins Math’s Top Prize - March 2019 - Karen Uhlenbeck, a University of Texas at Austin emeritus professor renowned for her groundbreaking advancements in geometric analysis and gauge theory, is the first woman to win mathematics' most prestigious Abel Prize. Since the prize's inception in 2003, 20 awards have been distributed, including six to mathematicians who were recognized jointly. One of Uhlenbeck's most significant discoveries revolves around understanding curved minimal surfaces that force themselves into shapes that minimize energy by taking up the least amount of area possible.

Nobel Prize in Physics Awarded to a Woman for First Time in 55 years - October 2018 - For the first time in half a century, and for only the third time in its history, the highest physics honor was awarded to Donna Strickland, a Canadian physicist, jointly with Gérard Mourou, from France, for their work on generating high-intensity, ultra-short optical pulses. The Academy described their inventions as having “revolutionized laser physics.” Marie Curie was the first woman to win a Nobel Prize in Physics in 1903 for her co-discovery of radiation and Maria Goeppert-Mayer won in 1963 for nuclear structure breakthroughs.

Indian Biostatistician Contributes Genetic Breakthrough - 2017 - Sanghamitra Bandyopadhyay, the Director of the Indian Statistical Institute received the Infosys Prize 2017 in Engineering and Computer Science for her research in algorithmic optimization, which has led to the discovery of a genetic marker for breast cancer and the role of white blood cells in Alzheimer’s disease.

A Woman Helps Create First Ever Image of a Black Hole - June 2018 - Katie Bouman, Ph.D. in electrical engineering and computer science from the Massachusetts Institute of Technology wrote the algorithm to produce the first ever image of a black hole, located at the center of the Messier 87 (M87) galaxy. A black hole is a region of space that has a gravitational pull so powerful that nothing, including light, can escape. Her work focused on running tests on synthetic data and making sure that the methods they used to make the image kept human bias out of the equation.

First Woman Wins Mathematics’ Fields Medal - 2014 - Maryam Mirzakhani, a Stanford University professor, was the first and only woman to win the prestigious Fields medal in mathematics. The Fields Medal is presented every four years and is considered the mathematics equivalent of the Nobel Prize. She was named for her work on complex geometry and dynamic systems.

Female Scientists Create Database to Showcase Work; database grows to over 9,000 women - May 2018 - a group of female scientists, tired of seeing only male scientists quoted as experts and invited to conference panels, formed a group, 500 Women Scientists, and created a database comprised of female experts in science. The Request a Scientist database has grown to include more than 1,000 women scientists from over 100 countries and makes it easy to find a female scientist based on her area of expertise, location, discipline, career stage and areas of interest. The group also offers a fellowship, tools for ensuring inclusive scientific meetings, support for mothers in science, Wikipedia Edit-a-thons to combat bias on the free encyclopedia’s pages and a satellite organization, 500 Women in Medicine.
Room for Improvement

• **NASA Cancels First All-Female Spacewalk Due to Spacesuit Size Issues:** This March, NASA planned a milestone with the first ever all-female spacewalk. The historic moment was postponed, however, as NASA did not have properly fitting and space-ready suits for the astronauts. There was only one suit in the correct size for women deemed to be safe-to-use on the International Space Station.

• **Subtle Biases in Medical Education:** 78% of the faces in core medical textbooks are male. [1]

• **Women Less Likely to Peer-Review:** 74% of peer-reviewers for The Lancet are men. [2]

• **Women in Science Receive Less Grant Money than Male Peers:** Researchers in JAMA found that on average, first-time male lead investigators were awarded $41,000 more than their female counterparts. Applications with a female PI received a median grant of $126,615, while applications with a male listed as PI received an average of $165,721. [3]

• **Academic Journals Still Dominated by Male Editors:** Of 15 top journals relevant to neuropsychology, only 3 were helmed by women editors-in-chief. [4]

• **High Achieving Women Spend More Time than High Achieving Men in Traditional Roles:** In a study of medical school faculty, women spent 8.5 hours more per week on parenting and domestic tasks than men, even after adjustment for factors such as spousal employment status. [5]

The Path Forward: Available Resources & Support

There are a number of resources geared toward supporting women in science ranging from mentorship to leadership to salary negation to advocacy. Some resources are in our own backyard with multiple groups dedicated to women’s issues within neuropsychology and psychology!

• **National Academy of Neuropsychology, Women in Leadership (WIL)** is dedicated to the education and encouragement of women neuropsychologists to leadership positions with various sponsored activities during the year including the annual Edith Kaplan Scholarship Award and Sponsorship program for trainees.

• **American Psychological Association (APA) Division 40, The Society for Clinical Neuropsychology, Women in Neuropsychology (WIN)** sponsors activities at annual meetings by the American Psychological Association and International Neuropsychological Society. WIN has an active listserv and highlights women in neuropsychology in the “WINner’s Box” in the Division 40 Newsletter.

• **APA Division 35, Society for the Psychology of Women** promotes teaching, research, and practice of psychology of women. Women and men of all national origins are encouraged to join and several subcommittees focus on specific multicultural group experiences. There are regular publications and a listserv.

• **APA Women’s Programs Office** offers several programs promoting women in psychology.
  ° The Leadership Institute for Women in Psychology supports and empowers women in leadership by providing education and workshops (must apply). They focus on mid-career and senior women psychologists in particular.
  ° I am Psyched! National Tour is a national tour to educate and promote diverse young women and girls about psychology, and to consider careers in the field.
  ° The Committee on Women in Psychology represents women’s interests within APA and makes recommendations to the organization.

• **The Association for Women in Psychology (AWP)** is an interdisciplinary, feminist organization including psychology and allied health. The AWP promotes multicultural and diverse representation in scholarly activity, teaching, practice, and networking, and advocates for social justice initiatives.
In addition, there are a number of groups promoting women in sciences, in general.

- The Association for Women in Science promotes the advancement of women in STEM through advocacy and public engagement, leadership development, research, and partnering with businesses.
- The National Academies of Sciences Committee on Women in Science, Engineering, and Medicine collects and disseminates information on education and employment of women to promote advancement of women in science.
- Graduate Women in Science empowers through grants, fellowships, and awards. There are local chapters in many states with a national conference and mentoring available.
- NIH Women in Biomedical Careers works to promote entry, recruitment, retention, and sustained advancement of women in biomedical careers. They aim to identify innovative strategies such as family-friendly policy changes. Resources include workshops, mentoring, and leadership development. They also offer a Women of Color Research Network for social networking and support of diversity.
- The Gender Equity Project aims to promote equity and excellence with an emphasis on academia. They offer grant writing tips, conferences, and mentoring.
- The American Association of University Women (AAUW) offers free online workshops on salary negotiation and is committed to training 10 million women on the topic by 2022. The AAUW Start Smart program is geared towards college women entering the workforce, focusing on negotiating new jobs. The Work Smart program is aimed at women in the workforce, helping to negotiate new jobs, raises, or promotions.

Finally, there are publications on women in neuropsychology leadership, advancement, and practice. The following references are must-reads!

- The Lancet’s Special Issue: *Advancing Women in Science, Medicine, and Global Health* (2019). 393 (10171), p 493-610.

**References**

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Managing Student Loans in Postdoctoral Fellowship and Beyond

Jonathan M. Grabyan, Ph.D. & Victor A. Del Bene, Ph.D.

After you celebrate graduating and completing internship, you will become an early career psychologist (ECP). With that new title comes the stresses of either beginning postdoctoral fellowship to continue training to become a clinical neuropsychologist or starting your first job. This early career transition period is also marked by the first of many student loan payments. There are multiple approaches to managing your student loans and the best approach will be determined by your total loan amount, your salary and family finances, living expenses, and various other individual factors that must be considered.

Student loans are a major societal problem. The U.S. National Student Loan Debt is $1.56 trillion, extending across 44.7 million U.S. borrowers, with an 11.4% delinquency or default rate. These often-discussed statistics cover money borrowed for all degrees. Regarding psychology specific statistics, the 2018 APPIC Match applicant survey revealed a mean graduate level debt of $91,550 (SD = 103,937, median = $60,000). Forty percent reported debt above $100,000, while 10% reported debt exceeding $250,000. Only 27% reported no debt. Clearly, student loans affect most graduate students and early career psychologists. A large debt burden at the beginning of a career can alter job choices, influence decisions to relocate or change careers, and affect the mental health and financial stability of borrowers and their families.

Knowledge of the statistics only gets you so far. It does not help you make the payments, nor does it help you approach the repayment in a fiscally responsible manner. However, there are resources available to help with student debt and financial planning. Below is information on various loan repayment options. Before committing to a plan, we strongly advise you to carefully consider all options and to speak with a financial advisor (academic medical centers and universities sometimes offer this as an employment benefit). It would also be important to meet with a financial advisor periodically to check that you are on track, and to modify your plan as life continues to change around you (marital status, children, illness, changes in salary and benefits, etc.).

**Repayment Options**

The first option is making your monthly payments in full, or paying more per month to reduce the duration and the amount of interest you will accrue.

- Unfortunately, not everyone is flush with cash and this may not be an option for all trainees. There are loan forgiveness options you may qualify for:
  - If your total debt is relatively small, this may be the best route; most forgiveness options will take many years before you can fully reap their benefits.

**Private loans**

- These very rarely qualify for any loan forgiveness programs.

**Federal loans**

- Once you’ve started making payments, you can change your repayment plan at any time. Just be mindful that this could change your monthly payments and may make you ineligible for certain forgiveness plans.
- The Federal Student Aid website (https://studentaid.ed.gov/sa/repay-loans/understand/plans) provides options on many different repayment plans.
  - Certain plans, such as income-based repayment (which is needed for public service loan forgiveness) requires that you have direct subsidized and unsubsidized loans, Federal Stafford Loans, and PLUS loans.
  - Look into loan consolidation.
    » A direct consolidation loan allows you to combine multiple federal education loans into one, resulting in one single monthly payment.
    » This is required for forgiveness programs.
  - Income-driven repayment sets your monthly payment at a level that is affordable based on your taxable income and family size. Depending on the plan you choose, your spouse’s income may be included in this calculation. These plans reference your most recently filed tax returns to calculate your payment—so if you start in your first year as a postdoc, your (likely low) internship income will be used in the calculation! Thus, expect your payments to increase notably for the first few years as an ECP as your taxable income increases. These plans include:
    - Revised Pay as You Earn Repayment Plan (REPAYE Plan)
    - Pay as You Earn Plan (PAYE Plan)
    - Income-Based Repayment Plan (IBR Plan)
    - Income-Contingent Repayment Plan (ICR)

**Public Service Loan Forgiveness (PSLF)**

- If you are employed by a government (e.g., VA, DoD, state agency) or not-for-profit organization (e.g., most Academic Medical Centers), you might be able to receive loan forgiveness.
  - PSLF forgives the remaining balance of Direct Loans after 120 qualifying monthly payments under a qualifying repayment plan while working full-time for a qualifying employer.
  - You cannot accelerate the process by paying more per month.
- To qualify:
  » Work for federal, state, local, or tribal government
  » Not-for-profit organization (NPO) that are tax-exempt under section 501(c)(3) of the Internal Revenue Code, or other types of NPOs that are not tax exempt under section 501(c)(3) of the Internal Revenue Code, if their primary purpose is to provide certain types of qualifying public services. (If you do not work for a government agency, diligently verify your employer meets these criteria before engaging in PSLF).

- Look into loan consolidation.
  » A direct consolidation loan allows you to combine multiple federal education loans into one, resulting in one single monthly payment.
  » This is required for forgiveness programs.
- Income-driven repayment sets your monthly payment at a level that is affordable based on your taxable income and family size. Depending on the plan you choose, your spouse’s income may be included in this calculation. These plans reference your most recently filed tax returns to calculate your payment—so if you start in your first year as a postdoc, your (likely low) internship income will be used in the calculation! Thus, expect your payments to increase notably for the first few years as an ECP as your taxable income increases. These plans include:
  - Revised Pay as You Earn Repayment Plan (REPAYE Plan)
  - Pay as You Earn Plan (PAYE Plan)
  - Income-Based Repayment Plan (IBR Plan)
  - Income-Contingent Repayment Plan (ICR)

- To qualify:
  » Work for federal, state, local, or tribal government
  » Not-for-profit organization (NPO) that are tax-exempt under section 501(c)(3) of the Internal Revenue Code, or other types of NPOs that are not tax exempt under section 501(c)(3) of the Internal Revenue Code, if their primary purpose is to provide certain types of qualifying public services. (If you do not work for a government agency, diligently verify your employer meets these criteria before engaging in PSLF).
» This includes:
  ° Public service for individuals with disabilities
  ° Public service for the elderly
  ° Public health
  ° Public education
» Full-time employment.
» Full-time employment.
» Only Direct Loans are eligible for PSLF.
  ° If you graduate before July 1, 2010, you might have Federal Family Education Loan (FFEL) loans or Federal Perkins Loans. You might need to consolidate into a Direct Loan. Consolidating will reset the clock on your 120 PSLF payments so do this very early in the process!
° We urge you read this carefully and in its entirety.
• Problems with PSLF?
  - With news headlines such as “99.5% Of People Are Rejected for Student Loan Forgiveness Program” frustration, anger, and despair are some emotions you may experience. There is good and bad news.
  » The bad news is that most applications were denied after making 120 payments1.
    ° 49,669 applications were submitted and 423 were approved.
    ° 11,892 were denied due to missing information.
  - There is hope for people on this plan though.
  » 206 received forgiveness for a total of $12.3 million meaning the program can work.
  » Most who were denied (72%), were denied because they did not meet requirements, and 27% were denied due to missing or incomplete information1.
    ° Reading this section of the NAN Bulletin is the first step to ensuring you have the correct information.
    ° Pay attention! Make sure your job is with the government or a 501(c)(3).
    ° Keep track of all your 120 payments. Don’t just rely on the loan servicer!
    Submit this annually to ensure you are on track and everything is documented, as well as when you begin a new job in public service or switch employers.
    ° Enroll in an income-driven federal student loan repayment plan. You won’t qualify if you don’t do this step!
    ° Consolidate your federal student loans.
• Remember that PSLF is not guaranteed. There is a risk that after 120 payments you are not forgiven, either because of an error, missing information, or not working for a qualifying employer. If you document everything and save all your payment receipts, you reduce this risk. That said, you cannot control economic and political forces and the future solvency of the program. Interest will continue to accrue as you participate in this program.

NIH Loan Repayment Programs (LRPs)
• Set up by the United States Congress to recruit and retain highly qualified health professionals into biomedical and biobehavioral research centers (https://www.lrp.nih.gov/).
  - LRP repays up to $50,000 annually of a researcher’s qualified educational debt in return for a commitment to engage in NIH mission-relevant research.
  - The application period is between September 1, 2019 and November 15, 2019; this occurs annually.
  - Dr. Ericka Boone, director of the NIH Division of Loan Repayment, provides her view on the NIH LRP (https://www.youtube.com/watch?v=il3gCbsAZBY&t=6s).
  - Check out the LRP Ambassador Program (https://www.lrp.nih.gov/ambassador-program/).
  - Remember that this program only pays for educational loans. So if you consolidate your loans, make sure to only consolidate your education loans. If you consolidate different loan types (e.g., education, home, etc.), the most likely the NIH LRP will not pay off that loan.
• This program is set up for individuals who spend most of their time (minimum of 50%) engaged in research activities.
• The recently reported success rate for the NIH LRP was 48%! Thus, there is about a 50-50 chance that if you apply for this, you just might get lucky! Plus, all the documents you write for this application (e.g., career plan, research plan, NIH Biosketch) are all applicable to other NIH grant applications.

Employer-Specific Programs
• Many positions targeted at ECPs have debt reduction incentives, the utility of which can vary significantly. Be sure to investigate such opportunities when on the job market. For example, some VA positions are eligible for the Education Debt Reduction Program (EDRP). This program pays you back whatever money you paid into your student loans on a yearly basis for 5 years, and can be used at the same time as PSLF.

Document all payments and discussions with loan service providers, ensure you complete the required documents annually, ensure your employer qualifies (this includes your postdoctoral fellowship), and invest the time and money into speaking with a financial advisor. Also read about PSLF and NIH LRPs regularly (better yet, sign up for their email updates) as the programs may change over time. Finally, make sure you keep track of the political climate surrounding these programs to inform your financial plan.

And remember, you are not alone in this process. Speak with friends, family, and trusted colleagues to help you manage this stressful hurdle and to engage with as a soundboard for advice. Debt is no one’s friend, but there are resources out there to help so make sure to reach out and take advantage of those resources.

References

About the Authors
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Both authors write from their personal experience. The views expressed here are not personal financial advice and do not reflect financial advice from NAN.
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Financing Graduate School

John Bernstein, M.A.
Clinical Psychology Predoctoral Intern | Minneapolis Veterans Affairs Health Care System
Clinical Psychology Doctoral Candidate | Louisiana State University

Individuals contemplating pursuing a doctoral degree in clinical psychology should strongly consider the funding situation of each program to which they apply. Many PhD and some PsyD programs offer tuition remission as well as a stipend; however, programs vary widely in this regard. Applicants should review each program's financial information online, and reach out to a program directly if this information is unavailable or unclear. Cost-of-living may also factor into decisions when considering which programs to apply to. Programs located in more rural areas and those not on the coasts may sometimes be friendlier toward the graduate student budget.

Programs with greater financial support are often among the most difficult to gain admission to; as a result, it is important to be realistic about one’s competitiveness and apply to a sufficient number of programs. While fees to apply to programs add up quickly, individuals may apply for federal, state and school-specific grants to help offset such application costs. Some graduate programs also offer fee waivers for individuals who come from underrepresented groups (e.g., McNair Scholars: http://www.coenet.org/files/mcnair_scholars_fee_waiver_list-Entire_List_071618.pdf).

Several federally-funded research fellowships (e.g., the National Science Foundation Graduate Research Fellowship (https://www.nsfgrfp.org), the National Defense Science and Engineering Graduate Fellowship (https://ndseg.asae.org) are specifically designed to support graduate school applicants and newer doctoral students with a research focus. These grants often will cover tuition, cost-of-living and research-related expenses. Such grants are competitive to attain and applicants must adhere to strict application deadlines. Thus, it is important to reach out to faculty research mentors early on in the academic year in order to be on time for these grant applications.

A multitude of smaller research grants, including several specific to clinical neuropsychology, are available to graduate students at all levels of training. While not all of these grants may be used to assist with tuition or cost-of-living, they nonetheless may cover research funding that otherwise would have to be paid out-of-pocket. A good list of these grants, as well as tips for applying to them, may be found at the Society for Clinical Neuropsychology - Association for Neuropsychological Students and Trainees (ANST) website (https://www.div40-anst.com/funding1.html).

If you are not in a fully funded doctoral program and if you did not receive financial support from one of the above-mentioned programs, you may need to take out student loans. If possible, try your best to limit your total loan burden. The American Psychological Association (https://www.apa.org/apags/resources/affording-repaying) has information on financing your education. Federal loans are ideal since private loans do not qualify for Public Service Loan Forgiveness (PSLF) and often have higher interest rates. Speak with your school’s financial aid office and consider speaking with a financial advisor about taking out loans and managing your loans in a fiscally conservative manner to prevent them from growing out of control. Note that you need to maintain full-time student status or you will be required to begin paying back your loans. Falling below full-time status, withdrawing from the program, or graduating means you will begin paying your loans after 6-months.

Toward the end of academic graduate training, most students can expect to incur one final but substantial expense: the internship interview process. Application costs, flights, housing, and meals accumulate fast, and students will find fewer financial mechanisms to support them at this juncture than they did when applying to graduate school. Planning ahead — booking flights early, staying with friends whenever possible, scheduling interviews in the same city or area on successive days — can be tedious but is worth the effort. If you accrue frequent flier miles from a credit card or conference travel while in graduate school, it may be a good idea to save those miles to lower the cost of your flights.

Irrespective of one’s level of training, employing some basic, daily money-saving strategies can be helpful in reducing living costs.

• Shopping at budget grocery stores, using coupons, and cutting down on eating out at restaurants can do wonders for a food budget, while getting together for potlucks with classmates may yield new cooking ideas (mac ‘n cheese cook-offs, anyone?).
• Consider exercising at your university’s recreation/wellness center rather than buying a private gym membership.
• Buy household and office items (e.g., couches, desks) off of internship-bound graduate students or second-hand stores.

The years spent in graduate school aren’t exactly known for being a luxurious period in one’s life. However, with adequate foresight, gumption, and persistence, they also don’t have to break the bank.

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Please note that the author is not a financial advisor. The views expressed here do not reflect the views of NAN.
Language in Neuropsychology Part 1: Linguistic Diversity & Determining Assessment Language

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Linguistic Diversity & Determining Assessment Language

This article is the first in a two-part series focused on language in clinical neuropsychology. This first part will provide a general overview of language, review its impact on neuropsychological assessment—particularly for those with English as a second language and non-English speaking individuals—and introduce methods for determining the language(s) of assessment for multilingual individuals. The second part will focus on the use of interpreters in neuropsychological assessment.

What is language and associated neuroanatomy?

Due to the heterogeneous nature of language, this section will focus on the various components of language and its functional neuroanatomy. Language is a form of communication that is generally comprised of phonology (i.e., study of speech sounds), syntax (i.e., relationships among words and structure of sentences), semantics (i.e., word meanings), and pragmatics (i.e., context or how one communicates messages to an audience). Spoken languages can also be paired with alternate forms of communication, such as Cued Speech or Braille (Aparicio, Peigneux, Charlier, Balériaux, Kavec, & Leybaert, 2017; Burton, Snyder, Conturo, Akbudak, Ollinger, & Raichle, 2002). Furthermore, language can exist through visuospatial modalities, as in sign language.

There are critical periods in our life where we are most sensitive to environmental influences, during which enrichment or deprivation can alter the trajectory of one’s ability to communicate (Kolb & Fantie, 2009). Those who experience language deprivation during the developmental period and regardless of language modality are likely to experience significant difficulties, particularly with the development of syntax (Mayberry, 2010; Skotara, Salden, Kügow, Hänel-Faulhaber, & Röder, 2012). Anatomically, for the majority of healthy right-handed and left-handed individuals, the left hemisphere of the brain is the mediator of primary verbal functions including speech, reading/writing, and comprehension (Lezak, Howieson, & Loring, 2004; Schoenberg & Scott, 2011). The right hemisphere plays a large role in other language abilities (e.g., pragmatic features of language like the coherence and cohesion of discourse, prosody, and following emotionally appropriate verbal behavior; Schoenberg & Scott, 2011).

Within the left hemisphere, there is significant focus on two localized cortical areas important for language expression and comprehension known as Broca’s area and Wernicke’s area, respectively. However, there is a growing body of evidence regarding other localized areas of language function, such as Exner’s area for writing (Benjamin et al., 2017). We also know these identified language areas do not work in isolation. For instance, there are primary cortical areas communicating to adjacent areas (e.g., multimodal areas), but there are also more extensive connections (i.e., sensory processing of visual and auditory information) where linguistic expression transcends mere left hemisphere language dominance, employing critical white matter tracts that primarily channel linguistic information (e.g., arcuate fasciculus; Blumenfeld, 2010; Schoenberg & Scott, 2011).

Furthermore, neuroanatomical representation can differ and/or change depending on various factors: the specific language(s) learned, whether one has learned multiple languages, and the age(s) the language(s) are acquired. For example, languages that employ tonal variations for semantics or visual designs for writing (i.e., logograms), such as Mandarin Chinese, also rely more on...
posterior and right hemisphere cortices during typical language processing (Liang & Du, 2018; Perfetti et al., 2007). Additionally, in multilinguals, overlapping networks in the left temporal region are engaged, with additional recruitment of frontal and subcortical structures to help with inhibiting non-target languages and switching between languages (Li et al., 2014; Luk et al., 2012; Sebastian et al., 2011). Multilinguals’ variation in neuroanatomy may depend on the age at which they acquired the secondary language, level of fluency, and behavioral ecology (e.g., usage patterns and linguistic environment). Cognizance of these variations in neuroanatomy can be critical, as it can impact clinical decision-making. For example, Kin and colleagues (2013) presented a case study of a Japanese–English bilingual businessman with left temporal tumor who required both languages to function at home and work. Bilingual language mapping revealed different eloquent cortex for the distinct languages. Successful excision of the neoplasm was possible without considerable functional deficit. Without this awareness to - or awareness of - neuroanatomical plasticity resulting from multilingualism, an otherwise successful procedure could have resulted in significant loss if only one language was used to map.

How does language impact neuropsychological testing and recommendations?
Various neuropsychological tests are employed to assess aspects of language, such as comprehension, expressive fluency, naming to visual or auditory confrontation, and repetition. Utilizing normative data sets, an individual’s performance can be compared and classified. However, language dominance can shape test results and diagnostic prognostications via direct and indirect mechanisms. For example, scores on language tasks for an English language learner (ELL) may fall below normative expectations due to secondary attainment of linguistic abilities and not due to organic dysfunction. Furthermore, an individual’s level of fluency in English (for which individuals may not be accurate judges; Gollan et al., 2012) can produce a downstream effect on other measures of cognitive performance for a variety of reasons (e.g., hindered comprehension of test instructions).

Moreover, adequate fluency in English does not translate to comparable scores between monolingual English speakers and bilingual speakers, as the performances between groups can differ due to cognitive effects of multilingual development in the latter group. For example, literature reveals better performance by multilingual participants on tasks measuring executive functions (e.g., inhibiting responses, quickly shifting between tasks) due to augmented experience in inhibiting intrusions from non-target languages and switching between languages. Some literature also suggests that vocabulary and naming performance by multilinguals may be lower compared to monolingual individuals (Adesope et al., 2010). However, individual differences vary secondary to many factors including baseline skills, exposure, and fluency across languages.

The impact of language on neuropsychological outcome measures is complex and must be carefully examined, as language may at times serve as a proxy for sociodemographic variables such as level of education, SES, lower level of acculturation, or different sociocultural experiences due to residing in ethnic enclaves. In comparison to other countries where bilingualism is more prevalent (Eberhard, Simons, & Fennig, 2019), bilingualism in the United States may be associated with relatively fewer resources. In addition, ethnic minority populations may be associated with inequity in various areas spanning nutrition and medical care during critical developmental stages, educational and occupational opportunities, cognitive stimulation throughout the lifespan, medical comorbidities, and/or availability of healthcare/insurance. These eclectic factors are known to impact neurocognitive abilities and performance on neurocognitive measures. Finally, additional layers of marginalization, discrimination, and/or acculturative stress can yield negative effects on cognition (e.g., reduced working memory capacity; Schmader, 2010). Experiences of acculturation or overt discrimination may also impact people’s report of language history and they may, consciously or unconsciously, overreport their level of English fluency. Negligence in accounting for these direct and indirect effects of language on testing contributes to diagnostic inaccuracy. For example, an individual may be ostensibly labeled as having dysfunction related to primary progressive aphasia or Alzheimer’s disease due to naming and semantic fluency impairments (compared to monolingual English-speakers). However, performance could be attributed to linguistic and educational history that differed from the normative sample as opposed to a pathologic process. Given the significance of the errors that may result from failing to consider language and its context, it is vital to assess an individual’s linguistic history and skills, and determine the appropriate language(s) for assessment.

How to determine language(s) of assessment?
The degree of language proficiency must be examined due to the well-documented disadvantages (in lexical access, vocabulary, and verbal fluency) and advantages (in executive control and cognitive reserve) observed in the literature regarding bilingualism and cognitive functioning (Bialystok & Craik, 2010). Because bilingualism is a continuous variable, neuropsychological test performance depends upon an individual’s position on the continuum of language proficiency (Ardila, Rodriguez-Menendez, & Rosselli, 2002). While assessment in the dominant language(s) yields the most valid test results for diagnostic purposes, screening of the less proficient language(s) is recommended to characterize level of mastery. Determining language of assessment can be a complex task for the examiner, especially if they have little to no knowledge of - or proficiency in - the patient’s primary language(s), have not been trained to evaluate non-native speakers of English, or are unskilled in working with signed language interpreters. As noted previously, many patients inaccurately gauge their language mastery. For instance, some patients may decide to be tested in English versus their native language stemming from their perceived ability to communicate in day-to-day interactions, negative life experiences with medical and behavioral health professionals, and negative experiences from mainstream society that emphasize the importance of English while discouraging reliance on secondary languages. Examining the patient’s perspective regarding their linguistic skills is imperative and this information can be initially gathered via clinical interviews. The following techniques can also be utilized by the clinician in order to determine the examinee’s language strengths and weaknesses.
1. **Self-report questionnaires** - Acculturation measures can be of assistance in determining language dominance. For example, the Marin Acculturation Scale (Marin & Gamba, 1996) includes questions regarding the use of Spanish and English, and the Deaf Acculturation Scale (Maxwell-McCaw & Zea, 2011) includes questions regarding the use of American Sign Language and English. Other questionnaires such as the Language Experience and Proficiency Questionnaire (LEAP-Q) provide more detailed queries of linguistic history (Marian et al., 2007).

2. **Performance-based tasks** - There are several performance-based options for determining the extent of linguistic abilities in each language. Although individuals are generally accurate at determining their dominant language, they are less accurate in gauging the extent of language mastery (Gollan et al., 2012). Some options include the Woodcock-Munoz Language Survey (Woodcock et al., 2005), verbal fluency ratios (Miranda et al., 2016), and confrontation naming ratios (Gollan et al., 2012).

3. **Choosing one versus multiple languages** - Accepting responses in more than one language can be a technique used by the examiner to ensure minimal impact of the patient’s linguistic skills on the cognitive domain under assessment. However, ascertaining the accuracy of these responses is crucial when examining the possibility of a language disorder or when assessing for neurodegenerative conditions that impact language skills. Sometimes, patients make linguistic errors, which require fastidious attention from the examiner in order to discern the responses. Alternatively, patients may engage in code-switching behavior during testing, which pertains to the oscillating use of two or more languages or dialects with minimal effort. This behavior among healthy individuals tends to represent language fluency, but may be misinterpreted as a deficit or disorder by the inexperienced clinician. While testing the domains in this manner is more comprehensive, care must be taken when comparing individual performance to standardized normative samples that did not test the limits in similar ways.

**Conclusion**

Out of all cognitive abilities, the expression of language is a skill that is constantly honed and altered via social interaction and environmental stimuli. As such, many language-neuroanatomy assumptions should be actively evaluated on a case-by-case basis. Linguistic function should be interpreted in conjunction with the individual’s background, including education, acculturation, and exposure. Moreover, acculturative stress can impact an individual’s performance on verbal measures. The intersection of these variables yields a complex clinical presentation that requires careful examination by neuropsychologists in order to accurately discern between signals of cognitive dysfunction and normal brain functioning in bilingual/multilingual patients.

**References**


References, continued


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Clinical Research Grants Program

NAN is committed to the professional and scientific development of clinical neuropsychology. The mission of the Clinical Research Grants Program is to support meritorious small grants, pilot projects, or seed grants that address the value, worth, or efficacy of clinical neuropsychological assessment or interventions. These projects might be overlooked by traditional granting agencies because of their applied clinical nature or stage of development.

Instructions for Completing NAN Grant Application:
- Download Application & Submission Guidelines at www.nanonline.org
- Follow all page requirements/limitations
- Prepare NIH biosketch
- If postdoctoral fellow, primary mentor needs to complete letter of support
- Sign all forms
- Create one PDF document for entire application
- Email application on or before deadline (June 1, 2020) to: NANGrants@nanonline.org

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2019 Recipients

Interdisciplinary Predictors of Long-Term Cognitive Recovery following Acute Stroke
Eric Hart, Psy.D. & Bradley Ferguson, Ph.D.

Reaffirming Neuropsychology’s Central Role in Understanding Alzheimer’s Disease in the Age of Biomarkers
Andrew Kiselica, Ph.D.
Across
4  NAN President in 1999
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14 Expressive aphasia
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18 Effect that demonstrates interference in reaction time of a task
19 Current NAN Executive Director
“Don’t Set Out on a Journey with Someone Else’s Donkey”: Enculturation and the Neuropsychological Assessment of African Immigrants

Anthony Y. Stringer, Ph.D., ABPP/ABCN | Professor
Jean Ikanga, Ph.D. | Staff Scientist
Emory University Department of Rehabilitation Medicine

The Somali admonition to avoid borrowing donkeys at the start of a journey, a common sense piece of advice, is one rarely followed when the purpose of the journey is to assess neuropsychological functioning of an African immigrant to the United States (U.S.). With an estimated 2.1 million people living in the U.S., the number of African immigrants has doubled every decade since 1970 (Anderson, 2017). The clinical neuropsychological needs of this population are understandably high when one considers the brain health challenges, especially in sub-Saharan Africa (SSA). Over 11% of the SSA population suffers from cerebrovascular disease (Mpanya et al., 2014). Worldwide, 86% of all stroke deaths occur in low-income countries, a majority of which are on the African continent (Feigin, 2005). Collectively, neurologic conditions account for as much as 24% of all admissions in African hospitals, with a third of these due to infections that affect the central nervous system including HIV/AIDS, human trypanosomiasis, cerebral malaria, bacterial meningitis, tuberculous meningitis, neurosyphilis, and cryptococcal meningitis (Mpanya et al., 2014).

Despite the many challenges they may have faced in their original home countries, the SSA immigrant population is highly educated, with 39% holding a bachelor’s degree or higher compared to 29% of U.S. immigrants as a whole and 31% of the U.S. born population (Zong & Batalova, 2017). Seventy-five percent of adult SSA immigrants were in the labor force in 2015 and were much more likely to be employed in management, business, science, and art occupations (38%) than in natural resources, construction, and maintenance (3%) (Zong et al., 2017). One implication of this level of achievement is that when the effects of a high incidence of neurologic disease becomes manifest in this population, the impact on cognitive function will be a salient life issue and clinical neuropsychologists will need to saddle those proverbial donkeys. Contrary to the wisdom of the Somali saying, those donkeys are likely to be borrowed.

Western neuropsychological tests, including both composite batteries (e.g., the Halstead–Reitan Battery) and individual tests (e.g., the Hopkins Verbal Learning Test-Revised) have been translated into Xhosa, Swahili, Yoruba, and other African languages, to study the effects of neurologic and infectious disease on cognitive function (Boivin & Giordani, 2013; Hestad et al. 2016; Maj et al., 1991; Unverzag et al., 1996). Language translations address only one of the barriers to valid clinical neuropsychological assessment with African populations. Beyond language, many other factors affect neuropsychological testing in SSA. These factors include, but are not limited to, the availability of appropriate normative data, the strong African oral tradition, familiarity with stimuli content more common in the West than in Africa, discrepancies in access to education, differences in the skills emphasized by educational systems, and differences in the view taken towards individual striving in communal societies. Unfortunately, other than language translations of Western tests (sometimes with collection of local norms), we are aware of the lack of published neuropsychological instruments for African-born patients that take into consideration these many additional factors. Hence, we use the equivalent of “borrowed donkeys” in conducting clinical neuropsychological assessments in SSA.

In 2017, we initiated a collaboration between Emory University (Atlanta, Georgia) and Protestant University in the Democratic Republic of Congo (Kinshasa) to develop an African Neuropsychological Battery (ANB) for use with SSA populations, with the intent being to eliminate the need for those borrowed donkeys. The individual tests that comprise the ANB assess sensory and motor function, attention, visuospatial perception, object recognition and naming, learning and memory, abstract reasoning, and problem solving. Administration of the entire battery takes less than 3 hours, while individual tests rarely require more than 15-20 minutes. In consideration of the economic limitations in African health clinics, tests use inexpensive and readily available materials. For example, to assess motor function, we have patients rapidly stack small coins (e.g., a penny in the U.S.) and to assess reasoning, we have patients play a game using a standard deck of cards. The largest expense is for spiral bound stimulus books that contain standardized test stimuli (essentially the cost of paper duplication and binding), and this is a one-time expense for the life of the battery.

ANB tests use content and themes familiar to individuals raised in SSA. For example, an ANB verbal memory test tells a story about rural village life with characters who have African names. A visuospatial memory test uses fabric patterns and designs from West Africa. A naming test includes African clothing, musical instruments, and indigenous fruits and vegetables. An associative learning test includes animals and landscapes from Africa. Abstract reasoning assessment integrates African proverbs and problem-solving assessment uses familiar playing cards and a format similar to a card game that is played throughout SSA.
In Congo, we collected normative data from the healthy population stratified by age, education, sex, and region of residence. We were able to show acceptable internal consistency reliability and found that the ANB was able to distinguish neurologic patients from healthy controls, and detected the impact of poor nutrition, exposure to environmental toxins and contaminated water, meningitis, hypertension, diabetes, and alcohol abuse on cognitive performance.

After completing this initial normative and validation study in Congo, and with a grant from the National Academy of Neuropsychology (NAN) Clinical Research Grant Program, we have begun to explore the impact of African enculturation on ANB performance. Enculturation involves the acquisition of the knowledge and skills necessary for functioning competently within a particular culture including the language, values, preferences, rituals, etc., shared by members of the culture (Bolaffi, Bracalenti, Braham, & Gindro, 2003). In common usage, the term refers to acquisition of knowledge about the culture into which one is born. Closely related to this is the concept of acculturation, which refers to the acquisition of knowledge about a culture that is different from one’s birth culture that comes about as a result of contact with members of the new culture (Berry, 2015; Bolaffi et al., 2003). Depending upon how similar their birth culture is to the cultural environment of the U.S., African immigrants may be at a disadvantage due to a lack of American acculturation. What happens, however, when the clinical neuropsychological test battery is not the equivalent of a borrowed Somali donkey, but instead is culturally appropriate for the SSA immigrant? This is what, with support from the NAN grant, we are attempting to determine.

Our initial results suggested that the relationship between African enculturation and ANB performance is complicated and not always in line with expectation. When asked via a questionnaire about how frequently they engage with African food, music, festivals, etc., not surprisingly, African immigrants show greater African enculturation than do Caucasian Americans, and African Americans score in between these two groups. African enculturation also correlated with the ability to identify fruits and objects common in Africa, but not in the U.S. As we expected, African immigrants are more accurate in identifying African fruits and objects than are Caucasians. African Americans were in the middle in identifying African cultural objects, scoring lower than immigrants and higher than Caucasians, but not differing statistically from either group. For African fruits, African Americans had no advantage over Caucasians, and both groups were worse than immigrants. African enculturation, however, did not correlate with visuospatial memory despite the use of stimuli from Africa. Caucasians performed as well as Africans, but both groups showed a statistical advantage compared to African Americans.

Perhaps the most interesting result of all was what we failed to see. We failed to see a difference between African immigrants, African Americans, or Caucasians on the majority of the ANB tests. Even where a statistically significant difference was present, it had little practical significance (e.g., Africans on average could name 1-2 more fruits than African Americans and Caucasians) and what small advantage that was present, favored African immigrants.

While failing to reject a null hypothesis does not mean we can say with certainty that the ANB eliminates cultural bias in assessing African and African immigrant populations, the results are encouraging. We have much more normative research to do and anticipate further fine-tuning of the ANB. Nonetheless, we are considerably closer to having an inexpensive, culturally appropriate, and clinically valid battery for comprehensive neuropsychological assessment both in SSA and in the ever-increasing African immigrant population in the USA. Clinical neuropsychologists working with African populations may one day be able to return those borrowed donkeys.

References


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