## DIVISION 40 PROGRAMMING: Quick Reference

### Thursday, August 8

<table>
<thead>
<tr>
<th>Time</th>
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</table>
| 8:00 AM – 10:50 AM | Marriott Marquis Water Tower Rooms A & B  | Division 40 Executive Meeting  
Chair: Michael McCrea, PhD |
| 8:00 AM – 8:50 AM   | McCormick Place Room W179a                     | Skill Building Session: Functional Neuroanatomy Primer – From Textbook to Case Conceptualization  
Chair: Cady Block, PhD; Participants: Darrin Aase, PhD; Amanda Gooding, PhD |
| 9:00 AM – 10:50 AM   | McCormick Place Room W180                      | Symposium: An Integrative Approach to Capacity: Philosophical, Ethical, Forensic, and Diversity Issues  
Chair: Lynn A. Schaefer, PhD; Participants: Maximillian H. Shmidheiser, PsyD, Lynn A. Schaefer, PhD, Chriscelyn M. Tussey, PsyD, Brian P. Yochim, PhD & Peter A. Lichtenberg, PhD |
| 11:00 AM – 11:50 AM  | McCormick Place Room W179b                     | Invited Address: Therapy-Induced Brain Reorganization Patterns post Traumatic Brain Injury: A Randomized Control Trial  
Sakshi Chopra, PhD |
| 12:00 PM – 12:50 PM  | McCormick Place Room W181a                     | Invited Address: "Fellows Luncheon & Address"  
Lecture: When Two in the Bush Might be Better than One in the Hand: The Value of Practice Effects in Cognitive Aging and Alzheimer's Disease  
Kevin Duff, PhD |
| 1:00 PM – 1:50 PM    | McCormick Place Room W185a                     | Invited Address: Interpreting Scores in the Context of Syndromes, Brain-Behavior Relationships, and Clinical Course  
Rodney D. Vanderploeg, PhD |
| 2:00 PM – 2:50 PM    | McCormick Place Room W184a                     | Invited Address: "Omic" in Neuropsychology – Current State and Future Directions  
Robert Bilder, PhD |
| 2:00 PM – 2:50 PM    | McCormick Place Room W192b                     | Conversation Hour: ECNPC Representative Network – Creating Connections  
Co-Chairs: Callie Dunn, PhD & Cady K. Block, PhD; Participants: Darrin Aase, PhD & Scott Sperling, PsyD |
| 3:00 PM – 3:50 PM    | McCormick Place Hall F                         | Poster Session I |
| 3:00 PM – 3:50 PM    | McCormick Place Room W178a                     | Skill Building Session: Clinical Case Presentations Hosted by the Association of Neuropsychology Students & Trainees (ANST)  
Co-Chairs: Lucas D. Driskell, PsyD & Scott A. Sperling, PsyD; Participant: Victor A Del Bene, PhD |

### Friday, August 9

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| 8:00 AM – 8:50 AM | McCormick Place Room W179a                     | Invited Address: Testimony That Sticks: The Art of Communicating Psychology and Neuropsychology to Juries  
Karen Postal, PhD |
| 8:00 AM – 8:50 AM   | McCormick Place Room W196bc                     | Collaborative Skill Building Session: How to Prepare for Specialty-Track Predoctoral Internships  
Co-Chairs: Victor A Del Bene, PhD & Scott Sperling, PsyD; Participants: Victor A Del Bene, PhD, Scott Sperling, PsyD, Veronica Bordes Edgar, PhD, Laurie Nash, PhD, & Justin Nash, PhD |
9:00 AM – 9:50 AM
McCormick Place Hall F
Poster Session II

10:00 AM – 10:50 AM
McCormick Place Room W471a
Symposium: Examining the Clinical Utility of NIH Toolbox for Use with Adult and Older Adult Neurologic Patients
Chair: Julie N Hook, PhD, MBA & Richard Gershon, PhD; Participants: Julie Hook, PhD, MBA, David Tulsky, PhD, Sandra Weintraub, PhD & Richard Gershon, PhD

10:00 AM – 11:50 AM
McCormick Place Room W470b
Research and Early Career Awards Ceremony
Chair: Douglas Whiteside, PhD
Levitt Lecture: Cholinergic Nucleus 4 Density and Early Cognitive Decline In Parkinson Disease
Scott Sperling, PsyD

12:00 PM – 12:50 PM
McCormick Place Room W178b
*Symposium: Balancing Your Life: Perspectives on Navigating Professional and Personal Challenges
Chair: Abbey Hughes, PhD; Participants: Krista Lisdahl, PhD, Michelle Madore, PhD & Dawn Ehde, PhD

4:00 PM – 4:50 PM
McCormick Place Room W181c
*Invited Address: Paths Forward in Neuroscience – A Perspective from NINDS
Patrick Bellgowan, PhD

5:00 PM – 5:50 PM
Marriott Marquis Grand Horizon Ballroom B
Division 40 Presidential Address: Modern Advances in Precision Neurotrauma: Neuropsychology's Vital Role
Michael McCrea, PhD

6:00 PM – 6:50 PM
Marriott Marquis Grand Horizon Ballroom B
Division 40 Business Meeting
Chair: Michael McCrea, PhD

7:00 PM – 8:50 PM
Marriott Marquis Grand Horizon Ballroom B
Division 40 Social Hour

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Saturday – August 10

8:00 AM – 9:50 AM
McCormick Place Room W184bc
*Invited Skill-Building Session: The 2019 CPT Testing Codes
Chair: Antonio E. Puente, PhD; Participants: Neil Pliskin, PhD, Stephen Gillaspy, PhD & Randy Phelps, PhD

8:00 AM – 9:50 AM
Marriott Marquis Marina City Room
APA Student Assessment Awards & Breakfast (Co-Sponsored by Div. 5, Div. 12 Section IX, and Div. 40)

8:00 AM – 9:50 AM
McCormick Place Room W196bc
Collaborative Symposium: Modern-day Strategies to Support and Market Your Research Program: An Interactive Mentoring Workshop
Co-Chairs: Laura Zahodne, PhD & Michael Alosco, PhD; Participants: Shawn McClintock, PhD, Walter Boot, PhD, Anthony Sterns, PhD, & Cady Block, PhD

11:00 AM – 11:50 AM
McCormick Place Room W179b
*Symposium: Redefining the Taxonomy of Disease: The Case of Epilepsy
Chair: Bruce Hermann, PhD; Participants: Laura Lubbers, PhD, Jana J Jones, PhD, Bruce Hermann, PhD & Jeff Binder, MD

12:00 PM – 12:50 PM
McCormick Place Room W186c
*Invited Address: Use of Technology to Enhance the Delivery of Neuropsychological Services in the Operating Room
David Sabsevitz, PhD

1:00 PM – 1:50 PM
McCormick Place Hall F
Poster Session III
**4:00 PM – 4:50 PM**  
McCormick Place Room W181b  
*Skill Building Session:* Women in Psychology: Family Planning While in Training  
Co-Chairs: Lucas D. Driskell, PsyD & Scott A. Sperling, PsyD. Participants: Lauren Mizock, PhD, Cynthia S Kubu, PhD, Kristine T Kingsley, PsyD & Emily B Leaffer, PhD

**4:00 PM – 4:50 PM**  
McCormick Place Room W185a  
**Paper Session I:** Statistical and Brain Mapping Approaches for Detecting Neurocognitive Impairment  
Chair: Michael Alosco, PhD; Participants: Gabriel De la Torre, PhD, August Price, MA, Duke Han, PhD & Meredith Kneavel, PhD

**5:00 PM – 5:50 PM**  
McCormick Place Room W185d  
*Symposium:* Developing New Methods of Assessing Performance Validity  
Co-Chairs: Douglas M Whiteside, PhD & Michael R Basso, PhD; Participants: Lisa Rapport, PhD, Michael R Basso, PhD, Jordan Hoffmeister, BA, Owen J Gaasedelen, PhD & Julie Suhr, PhD

**5:00 PM – 5:50 PM**  
McCormick Place Room W187b  
*Symposium:* Why Can't We be Friends: An Integrated Approach to Applied Neuropsychological Services and Training  
Chair: Amanda Skierkiewicz, EdD; Participants: Elizabeth M. Power, EdD, Kelsey Oster, PsyD, Edgar Ramos, PsyD & Sarah Riccio, MA

**8:00 AM – 8:50 AM**  
McCormick Place Room W185b  
**Paper Session II:** At The Crossroads of Psychiatric and Cognitive Alterations  
Chair: Darrin Aase, PhD; Participants: Justin Karr, PhD, David Marshall, PhD, Gregory Brown, PhD, & Jordan Hoffmeister, BS

**9:00 AM – 9:50 AM**  
McCormick Place Room W184bc  
*Symposium:* New Methods of Diagnosis and Treatment – Digital Biomarkers, Brain Stimulation, and Neurofeedback  
Chair: Jimmy Choi, PsyD; Participants: William J Bosl, PhD, Maj Daniel A Jacobson, PhD & Jimmy Choi, PsyD

**10:00 AM – 10:50 AM**  
McCormick Place Room W185a  
*Symposium:* Publication Pitfalls -- Ethical Dilemmas in the Peer Review Process  
Chair: Michael R Basso, PhD; Participants: Julie Suhr, PhD, Lisa Rapport, PhD & Michael R Basso, PhD

**11:00 AM – 11:50 AM**  
McCormick Place Room W181a  
*Invited Address:* Neuropsychology in an Aging Word: Is the Field Ready?  
Vonetta Dotson, PhD

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**Sunday – August 11**
### APA Annual Convention

**Division 40 (Society for Clinical Neuropsychology)**

**Program Summary – August 8-11, 2019; Chicago, IL**

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<td>Maximillian H. Shmidheiser, PsyD</td>
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<td>Theoretical Perspectives on Voluntarism, Decision-Making and Informed Consent</td>
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<td></td>
<td>Capacity: A Forensic Psychologist’s Perspective</td>
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<td>Brian P. Yochim, PhD</td>
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<td>Considerations of Ethnic Diversity When Determining Capacity to Make Medical Decisions</td>
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<td>Peter A. Lichtenberg, PhD</td>
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<td>Intersection of Financial Decision-Making Deficits and Exploitation in Older Urban African Americans</td>
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<td><strong>Invited Address:</strong> Sakshi Chopra, PhD</td>
<td>Therapy-Induced Brain Reorganization Patterns post Traumatic Brain Injury: A Randomized Control Trial</td>
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<td>Senthil Kumaran, PhD</td>
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<td>Sumit Sinha, MD</td>
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<td>Ravindra Pandey, PhD</td>
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Harsimarpeet Kaur, PhD
Ashima Nehra, PhD

12:00 PM – 12:50 PM
McCormick Place Room W181a
Fellows Address: **Fellows Luncheon & Address**

Lecture: **Kevin Duff, PhD**
*When Two in the Bush Might be Better than One in the Hand: The Value of Practice Effects in Cognitive Aging and Alzheimer's Disease*

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"Omic"s in Neuropsychology – Current State and Future Directions

2:00 PM – 2:50 PM
McCormick Place Room W192b
Conversation Hour: **ECNPC Representative Network – Creating Connections**

Co-Chairs
Callie Dunn, PhD
Cady K. Block, PhD

Participants
Darrin Aase, PhD
*Creating Connections: Perspectives From Illinois*
Scott Sperling, PsyD

3:00 PM – 3:50 PM
McCormick Place Hall F
Poster Session: **Poster Session I**

Kristine M. Bragg, PhD: *Mentoring in Neuropsychology: Methods and Outcomes From a Longitudinal Assessment*
Co-Authors
Gwen C. Marchand, PhD

Angely A. Piazza-Rodriguez, BA: *Exercise Predicts Memory Performance Over Time Among Older Latinx Adults*
Co-Authors
Dumichel Harley, BS
Jesús Rivera, BS
Savannah Rose, BA
Michael Creekpaum, MA
Juan P. Gonzalez, BS
Megan Frank, BA
Rowena G. Gomez, PhD

Kelsey R. Thomas, PhD: *Cognitive Training Increases MCI-To-Normal Reversion Rate in the Active Study*
Co-Authors
Sarah Cook, PhD
Mark W. Bondi, PhD
Karlene Ball, PhD
Associations Between Perseveration and Behavioral Functioning for Children With and Without ADHD

Co-Authors
Gabriel A. Casher, MA
Michelle Y. Kibby, PhD

Pupillary and Eye-Tracking Patterns to Emotional Faces Among Individuals With Social Anxiety

Co-Authors
Greg J. Siegle, PhD
Erin B. Tone, PhD

Relationship Between Bmi and Cognitive Change in Older Adults Using the Wisconsin Longitudinal Study

Co-Author
John L. Woodard, PhD

Correctional Inpatient Norms for the Rbans

Co-Authors
Leanne Ekstrom, PhD
Veronica Sanchez Varela, PhD

A Short Form of the Verbal Concept Attainment Test in Multiple Sclerosis

Co-Authors
Jordan Hoffmeister, BA
Michael R. Basso, PhD
Douglas M. Whiteside, PhD
Dennis Combs, PhD

Comparing Processing Speed and Memory Predicting Activities of Daily Living in Older Adults

Co-Authors
Angely A. Piazza-Rodríguez, BA
Nicole Greenberg, BA
Jesus Rivera, BS
Juan P. Gonzalez, BS
Rowena G. Gomez, PhD

Case Report on Moyamoya Disease

Co-Authors
Khushnoo Indorewalla, MA
Irene Piryatinsky, PhD

Brianna M. Hardt, BS: *Working Memory as a Mediator of the Relationship Between Education and Phonemic Fluency*
Co-Authors
Ann T. Nguyen, MA
Nicole M. Gatto, PhD
Grace J. Lee, PhD

Shreya Doshi, MA: *Response Inhibition in Adults With Depression and Attention Deficit Hyperactivity Disorder*
Co-Authors
Benjamin D. Freer, PhD
Lana Tiersky, PhD

Arthur M. Horton, EdD: *Toward a Short Form Test of Executive Functioning: Intelligence*
Co-Author
Cecil R. Reynolds, PhD

Amber D. Rochette, MA: *The Association Between Cognitive Screening Measures and Number of Falls in Post-Acute Care*
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Robert Hogikyan, MD
Kristen Phillips, PharmD
Fareeha Khan, MD
Jinkyung Ha, PhD
Neil Alexander, MD

Jessica Gormley, BS: *A Meta-Analysis: Predictive Value of REM Sleep Behavior Disorder in Diagnosis of Lewy Body Dementia*
Co-Author
Deanna Eilenberger, BS

Bethanie Wenke, MS: *Impact of Previous Concussion and Peer Concussion Education on Knowledge and Reporting*
Co-Authors
William Ernst, PsyD
Meredith E. Kneavel, PhD
Kevin S. McCarthy, PhD

Vigneswaran Veeramuthu, PhD, MEd: *Advancing Clinical Neuropsychology in Developing Nations: The Malaysian Journey and Ethical Dilemmas*

Ilyse O'Desky, PsyD: *Is Turner's Syndrome Actually Turner's Syndrome?*

Mirella Diaz-Santos, PhD: *Cultural and Linguistic Competency Training From a Socially Responsible Neuropsychology Model*
Co-Authors
Paola A. Suarez, PhD
Xavier E. Cagigas, PhD
Lucia Cavanagh, PhD
Janet J. Yañez, MA
Evelyn Ramirez, MA
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Sara Pérez, MS: Neuropsychological Development in Syndromic Craniosynostosis
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Javier Gonzalez Marques, PhD
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Willam Ernst, PsyD: A Qualitative Thematic Analysis of a Concussion Reporting Activity With Collegiate Student-Athletes
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Anna T. Magnante, BA: Neurocognitive Functioning, Memory Recall and Recognition in Patients With Parkinson’s Disease
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Mackenzie D. Collen, BS: Psychosocial Stressors and Neurocognitive Functioning in Older Adults
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Kimberly Morales, BS
Scott Sautter, PhD

Grace Videla-Nash, BS: An Examination of Cognitive Abilities in Depressive Disorders

Sheliza Ali, MS: Considerations for the Multi-Disciplinary Assessment of Fasd With Adult Women Parenting an Infant
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Elizabeth Slavica, BS
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Victor Tran, MS: Beliefs About Hypertension and Risk of Alzheimer's Disease
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Kimberly Capp, MS
Deborah Radmanesh, MS
Madison B. Lenox, MS

Kami L. McManus, MS, MA: Traumatic Brain Injury and Sleep Disturbance: Effectiveness of Interventions

Kami L. McManus, MS, MA: Sleep Loss and the Self-Care Dilemma for Psychologists and Trainees

Justin Burgess, BA: Comparing Executive Function Between Outpatient Psychiatric and Neuropsychological Patients
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Brizel Trinidad, MS: SPECT Differences Between Patients With OCD and Comorbid OCD/GAD in a Child Sample
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Daniel Amen, MD
Kristin Willeumier, PhD
Derek Taylor, MS

Kristin Horne, BA: The Relationship Between WAIS-IV Index Scores and Executive Function Performance
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Damin Hadom-Papke, BS
Meghan Gilmore, BA
Charles J. Golden, PhD

Ruby Robledo, BA: Mono/Bilingual Neuropsychological Evaluations with Spanish Speakers: A Qualitative Review
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Andre Valdez, PhD

Buczylowska Dorota, PhD: Relationships Between Executive Functions, General Intelligence, and Specific Intelligence Domains
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Hyunjoo Song, PhD: Development of Mobile App (COCON) of Evaluating Cognitive Control Ability in Children and Adolescents
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YeonSoo Kim, BA
HanAha Jeong, BA
JinHyeong Choi, BA

Angelina Exline, BA: Neuropsychological Considerations for Adiposity Induced Neuronal Atrophy During Midlife

Miriam F. Krumholz, MA: The Effectiveness of Brief-Mindfulness Practice for Enhancing Attention
Co-Authors
Cornelia Pinnell, PhD
Frederick Wechsler, PhD, PsyD

Bailey McDonald, BS: Impact of Sleep Duration on Baseline Neuropsychological Testing in Collegiate Athletes
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Alison Datoc, BS
Anna Derbaly, BA
Lisa Lashley, PsyD
Charles J. Golden, PhD

Carla Cabrera, BA: Can Literacy Skills Predict Working Memory?
Co-Author
Charles J. Golden, PhD

Ana Lopez, BA: Cerebral Blood Flow Differences in an Opioid Use Disorder Population
Co-Authors
Alison Datoc, BS
Ryan Bennett, BS
Charles J. Golden, PhD
Daniel Amen, MD
Kristin Willeumier, PhD
Derek Taylor, MS

Julia Hussey, MA: Confirmatory Factor Analysis of the Impact in High School Athletes
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Kimberly A. Barchard, PhD
Hana Kuwabara, MA
Thomas F. Kinsora, PhD
Staci R. Ross, PhD
Sarah Flood
Brandon C. Fraga, BA
Daniel N. Allen, PhD
3:00 PM – 3:50 PM  
McCormick Place Room W178a  
**Skill Building Session: Clinical Case Presentations Hosted by the Association of Neuropsychology Students & Trainees (ANST)**  
**Co-Chairs**  
Lucas D. Driskell, PsyD  
Scott A. Sperling, PsyD  
**Participant**  
Victor A. Del Bene, PhD  
*Clinical Case Presentations Hosted by the Association of Neuropsychology Students and Trainees (anst)*  
**Co-Author**  
Cady Block, PhD

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**Collaborative Skill Building Session: How to Prepare for Specialty-Track Predoctoral Internships**  
**Co-Chairs**  
Victor A. Del Bene, PhD  
Scott Sperling, PsyD  
**Participants**  
Victor A. Del Bene, PhD  
*Special Considerations to Keep in Mind When Applying for Specialty Focused Internship Tracks*  
**Co-Authors**  
Lucas Driskell, PsyD  
Scott Sperling, PsyD  
**Interactive Small Group Session One: Neuropsychology in Academic Medical Center & CV Tips**  
**Co-Authors**  
Cady Block, PhD  
Laura Boxley, PhD  
Veronica Bordes Edgar, PhD  
**Interactive Small Group Session Three: Pediatric Neuropsychology - Internship and Interviewing Skill**  
Laurie Nash, PhD  
**Interactive Small Group Session Four: Rehabilitation & Neuropsychology – Overlapping Interests**  
**Co-Authors**  
Angela Kuemmel, PhD  
Carey Pawlowski, PhD  
Justin Nash, PhD  
**Interactive Small Group Session Five: Health Psychology - Internship and Beyond**  
**Co-Authors**  
Sabrina Esbitt, PhD  
Christina Shook, PhD

9:00 AM – 9:50 AM  
**Poster Session: Poster Session II**
Juan P. Gonzalez, BS: *Impact of Positive and Negative Symptoms and Depression on Executive in Psychotic and Depressive Disorders*

Co-Authors
Elizabeth W.M. Choi, MS
Michael Creekpaum, MA
Felicia Aponte-Eyl, BS
Angely P. Rodriguez, BA
Dumichel Harley, BS
Jesús Rivera, BS
Jennifer Keller, PhD
Rowena G. Gomez, PhD

Vanessa Watorek, MA: *Examining Loss of Set Performance and Cognitive Decline in an Older Adult Sample*

Co-Author
Robert Ferguson, PhD

Jonathan D. Sober, MA: *Auditory Verbal Learning Test Learning Slope Predicts Preclinical Mci in Apoe E4 Carriers*

Co-Authors
Jessica L. Katschke, MA
John L. Woodard, PhD
Kristy A. Nielson, PhD
Michael Seidenberg, PhD
J. Carson Smith, PhD
Sally Durgerian, BS
Stephen M. Rao, PhD

Alyssa N. De Vito, MA: *Cognitive Variability Is Related to Cognitive and Functional Status: Findings From the Civa Study*

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Ashley Pomes
Kristen Chedville
Lainey Henican
Gabriel Daniels

Bailey Cation, BS: *The Relationship Between Trauma Exposure and Executive Functioning in Aging Populations*

Co-Authors
Maximillian Obolsky, BS
Franchezka Lapitan, MA
Jessica Paxton, PhD

Jessica L. Katschke, MA: *Learning Slope of an Auditory Verbal Learning Test as an Index of Cognitive Decline in Older Adults*

Co-Authors
Jonathan D. Sober, MA
John L. Woodard, PhD
Kristy A. Nielson, PhD
Michael Seidenberg, PhD
Christopher Koch, PhD: Reliability and Test Differences for the Impact: Implications for Concussion Testing Programs
Co-Author
Sean Robertson, BS

Kharine Jean, BS: The Differential Effects of Education on Functional Status Based on Genetic Risk
Co-Authors
Talia Robinson, MS
Marissa Gogniat, BS, BA
L. Stephen Miller, PhD

Brandt C. Ling, BS: Culturally Sensitive Neuropsychological Assessment: Review of Literature and Recommendations
Co-Authors
Alexandra Melchiorre, MS
Kathleen L. Griffin, BS
Joshua D. Sensenbaugh, BS
Ergun Gokce, PhD
Janece Warfield, PsyD

John M. Czaplewski, MA: A Normative Study on the Brief Neuropsychological Cognitive Examination on Individuals 90 and Over
Co-Authors
Deborah Lewis, PhD
Eric Johnson, PsyD

Álvaro Lozano-Ruiz, MS: Cross-Cultural Differences in Working Memory Through the Digit Span Task of the Embraced Battery
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Brooke Leonard, MS
Julia Daugherty, MS
Miguel Perez-Garcia, PhD
Antonio E. Puente, PhD
Inmaculada Ibanez-Casas, PhD

Arthur M. Horton, EdD: Age and Education Correlates of a Short Form Executive Functioning Test
Co-Author
Cecil R. Reynolds, PhD

Jacob Varela, BS: Technology Use and Neurocognitive Functioning: A Systematic Review of Literature
Co-Authors
Anna Ord, PsyD, MA
Jeffery T. Jenks, BA
Hannah Pakray, MA: Case Study of Ad With Tactile Hallucinations and Somatic Delusions as Initial Symptoms
Co-Author
Elise Caccappolo, PhD

Margaret E. Wiggins, MS: Cognitive Reserve, Processing Speed, and Reasoning Contribution to the Digital Maze Test (dmaze)
Co-Authors
Jared Tanner, PhD
Catherine Dion, BA
Loren Hizel, MS
Ebony Blaize, BS
Lillian Short, BS
Palmer Tirrell, BS
Dana Penney, PhD
Randall Davis, PhD
Catherine Price, PhD

Yingjing Xia: Distinguishing Amnestic Mci Subtypes in Older Adults Via Screening Versus Expanded Memory Tests
Co-Authors
Ruiyu Yang
Victoria C. Merritt, PhD
Carlos E. Araujo, BS
Amy Jak, PhD

Sara E. Wise, BS: Executive Functioning in Adults With Childhood-Diagnosed Adhd: Patterns of Persistence and Remission

Jasmine S. Dixon, BS: Subjective Memory Complaints in Older Adults: Associations With Affect and Cognitive Outcomes
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Holly Cantu, BA
Robert Cunningham
Rudi Johnson
Luis E. Aguerrevere, PhD

10:00 AM – 10:50 AM
McCormick Place Room W471a

Symposium: *Examining the Clinical Utility of NIH Toolbox for Use with Adult and Older Adult Neurologic Patients*
Chairs
Julie N Hook, PhD, MBA
Richard Gershon, PhD

Participants
Julie Hook, PhD, MBA

Nih Toolbox: Overview and History
David Tulsky, PhD

Nih Toolbox Use in the Assessment of Traumatic Brain Injury
Co-Author
Jerry Slotkin, PhD
Sandra Weintraub, PhD

Nih Toolbox Use in the Assessment of Mild Cognitive Impairment and Alzheimer's Disease
Co-Authors
Cynthia Nowinski, PhD, MD
Richard Gershon, PhD

Nih Toolbox: Advances and Future Directions

10:00 AM – 11:50 AM
McCormick Place Room W470b

Research and Early Career Awards Ceremony
Chair
Douglas M. Whiteside, PhD

Levitt Lecture: Scott A. Sperling, PsyD
Cholinergic Nucleus 4 Density and Early Cognitive Decline In Parkinson Disease
Co-Authors
T. Jason Druzgal, MD, PhD
Joseph L. Flanigan, BA
Jamie C. Blair, BS
Mark E. Smolkin, MS
Matthew J. Barrett, MD

12:00 PM – 12:50 PM
McCormick Place Room W178b

Symposium: Balancing Your Life: Perspectives on Navigating Professional and Personal Challenges
Chair
Abbey Hughes, PhD

Participants
Krista Lisdahl, PhD
Striving for Balance and Sanity When You Are in the "Sandwich" Generation
Michelle R. Madore, PhD
Can the Perfect Balance Be Achieved?
Dawn Ehde, PhD
Fostering Individual Wellness: Evidence and Advice

4:00 PM – 4:50 PM
McCormick Place Room W181c

Invited Address: Patrick S.F. Bellgowan, PhD
Paths Forward in Neuroscience – A Perspective from NINDS

5:00 PM – 5:50 PM
Marriot Marquis Grand Horizon Ballroom B

Division 40 Presidential Address: Modern Advances in Precision Neurotrauma: Neuropsychology's Vital Role
Chair
6:00 PM – 6:50 PM
Marriot Marquis Grand Horizon Ballroom B
Division 40 Business Meeting
Chair
Michael McCrea, PhD

7:00 PM – 8:50 PM
Marriot Marquis Grand Horizon Ballroom B
Division 40 Social Hour

Saturday, August 10 2019
8:00 AM – 9:50 AM
McCormick Place Room W184bc
Invited Skill-Building Session: The 2019 CPT Testing Codes
Chair
Antonio E. Puente, PhD
Participants
Neil Pliskin, PhD
Stephen Gillaspy, PhD
Randy Phelps, PhD

8:00 AM – 9:50 AM
Marriot Marquis Marina City Room
APA Student Assessment Awards & Breakfast
Collaborating Divisions: 5, 12 Section IX, 40

8:00 AM – 9:50 AM
McCormick Place Room W196bc
Collaborative Symposium: Modern-day Strategies to Support and Market Your Research Program: An Interactive Mentoring Workshop
Co-Chairs
Laura Zahodne, PhD
Michael Alosco, PhD
Participants
Shawn McClintock, PhD
Walter Boot, PhD
Anthony Sterns, PhD
Cady Block, PhD

11:00 AM – 11:50 AM
McCormick Place Room W179b
Symposium: Redefining the Taxonomy of Disease: The Case of Epilepsy
Chair
Bruce Hermann, PhD
Participants
Laura Lubbers, PhD
*The Personal and Public Health Challenges of Epilepsy*
Jana J. Jones, PhD
*Psychiatric Comorbidity in Children and Adults With Epilepsy*
Bruce Hermann, PhD
*Lifespan Neuropsychology of Epilepsy*
Jeff Binder, MD
*Epilepsy Surgery Outcome: Seizures and Language*

12:00 PM – 12:50 PM
McCormick Place Room W186c
Invited Address: **David S. Sabsevitz, PhD**
*Use of Technology to Enhance the Delivery of Neuropsychological Services in the Operating Room*

1:00 PM – 1:50 PM
McCormick Place Hall F
Poster Session: **Poster Session III**
Alexis Bueno, AA: *Sleep Deprivation and Hyperalgesia in College Students*
Lynley G. Turkelson, BA: *A Differential Study on Cognitive Predictors of Math Computation, Math Concepts, and Math Fluency*
Co-Authors
Quintino Man, PhD
Miguel Nunez, BA
Jennifer Aldana, BA: *Levels of Anxiety in College Students With ADHD Symptomatology*
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Karen Wilson, PhD
Claire N. Speelman, MA: *Age of Onset in Temporal Lobe Epilepsy Is Associated With Emotional Functioning*
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Mark Fischer, MA
Paula K. Shear, PhD
Gabriella Y. Navarro, BA: *The Neuropsychological Correlates of the Cognitive Based Assessment*
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Maria T. Schultheis, PhD
Gabriella Y. Navarro, BA: The Neuropsychological Correlates of a Rehabilitation Based Assessment
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Dante R. Denardis: *Interactions Between Ethnicity, Gender, and Visual Memory: The Embraced Complex Figure Task*
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Antonio E. Puente, PhD  
Inmaculada Ibanez-Casas, PhD

Inmaculada Ibanez-Casas, PhD: Effects of Cultural Variables on the Learning Curve of Words: The Embraced Verbal Memory Task  
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Margaux Grivel, MA: Cognitive Functioning in Drug-Naïve Patients With Schizophrenia: Review of Studies  
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Marianne Broeker, BS  
Yi P. Li, MA  
Yun-Hsin Liu, MA

4:00 PM – 4:50 PM  
McCormick Place Room W181b  
Skill Building Session: Women in Psychology: Family Planning While in Training  
Co-Chairs  
Lucas D. Driskell, PsyD  
Scott A. Sperling, PsyD

Participants  
Lauren Mizock, PhD  
Current Issues Facing Women Training in Psychology While Planning for a Family  
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Professional and Leadership Development as a Trainee and Parent  
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Navigating the Practical and Legal Aspects of Parenthood During Training and Employment  
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The Importance of Building a Support System as a Trainee Planning for a Family
Co-Authors
Angela Fang, PhD
Renee Cloutier, MS

4:00 PM – 4:50 PM
McCormick Place Room W185a

Paper Session I: Statistical and Brain Mapping Approaches for Detecting Neurocognitive Impairment
Chair
Michael L. Alosco, PhD

Participants
Gabriel G. De la Torre, PhD
Machine Learning Assisted Model for Rbans Neurocognitive Assessment Process
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Sara Gonzalez-Torre, MA
August M. Price, MA
Detecting Simulated Dementia: Comparing Behavioral Measures With Event-Related Potentials
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Katherine Turk, MD
Duke Han, PhD
Perceived Discrimination in Older Black Adults Is Associated With Insula Functional Connectivity
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David Bennett, MD
Konstantinos Arfanakis, PhD
Lisa L. Barnes, PhD
Meredith E. Kneavel, PhD
Evaluation of the Effectiveness of a Novel Peer Concussion Education Program for College Athletes
Co-Authors
William Ernst, PsyD
Kevin S. McCarthy, PhD

5:00 PM – 5:50 PM
McCormick Place Room W185d

Symposium: Developing New Methods of Assessing Performance Validity
Co-Chairs
Douglas M. Whiteside, PhD
Michael R. Basso, PhD

Participants
Lisa Rapport, PhD
Biometric Enhancements of Performance Validity Tests
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Robert J. Kanser, MA  
Jesse R. Bashem, PhD  
Sarah D. Patrick, BA  
Michael R. Basso, PhD

*The Perceptual Memory Test: Initial Validity of a Novel Pvt*

---

Douglas M. Whiteside, PhD  
Isaac Hunt, PhD  
Jordan Hoffmeister, BA  
Ryan D. Mulligan, MA  
Daniel Guzman, MA

Jordan Hoffmeister, BA

*Use of the Gollin Incomplete Figures as a Performance Validity Test (pvt)*

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Michael R. Basso, PhD  
Isaac Hunt, PhD  
Douglas M. Whiteside, PhD  
Daniel Guzman, MA  
Ryan D. Mulligan, MA

Owen J Gaasedelen, PhD

*Construction and Validation of a Novel Neuropsychological Symptom Validity Test for the Personality*

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Douglas M. Whiteside, PhD  
Michael R. Basso, PhD

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5:00 PM – 5:50 PM

McCormick Place Room W187b

Symposium: *Why Can't We be Friends: An Integrated Approach to Applied Neuropsychological Services and Training*

Chair
Amanda Skierkiewicz, EdD, EdS

Participants
Elizabeth M. Power, EdD  
*Kelsey Oster, PsyD  
If I Only Had a Brain: School Neuropsychology From a Trainer*  
*Edgar Ramos, PsyD  
An Innovative Model for Student Training Across Disciplines: From University to Applied Settings*

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Amanda Skierkiewicz, EdD, EdS  
Matthew Landstrom, PsyD  
Sarah Riccio, MA

Discussant
Rik D’Amato, PhD
Sunday, August 11 2019
8:00 AM – 8:50 AM
McCormick Place Room W185b

Paper Session II: At The Crossroads of Psychiatric and Cognitive Alterations
Chair
Darrin M. Aase, PhD

Participants
Justin E. Karr, PhD
Age, Psychiatric Diagnosis, and Outcome at One Week Following Mild Traumatic Brain Injury
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Anna-Kerttu Kotilainen, BS
Teemu M. Luoto, MD, PhD
David F. Marshall, PhD
Impact of Cannabis and Alcohol Use Disorders on Clinical and Cognitive Outcomes in Bipolar Disorder
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Kelly A. Ryan, PhD
Scott A. Langenecker, PhD
Melvin G. McInnis, MD
Gregory G. Brown, PhD
Increased Sensitivity to Negative Reward Prediction Errors in Anorexia Nervosa
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Erin Reilly, PhD
Walter H. Kaye, MD
Jordan Hoffmeister, BS
Scales of Anxiety and Depression Better at Detecting Depression Than Anxiety in Multiple Sclerosis
Co-Authors
Ryan D. Mulligan, MA
Michael R. Basso, PhD
Douglas M. Whiteside, PhD
Dennis Combs, PhD

9:00 AM – 9:50 AM
McCormick Place Room W184bc

Symposium: New Methods of Diagnosis and Treatment – Digital Biomarkers, Brain Stimulation, and Neurofeedback
Chair
Jimmy Choi, PsyD

Participants
William J. Bosl, PhD
Monitoring Brain Activity to Develop Digital Biomarkers for Neurodevelopmental Disorders
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Helen Tager-Flusberg, PhD
Maj Daniel A. Jacobson, PhD

Impact of Rms on Cortisol Levels and Neuropsychological Functioning

   Co-Authors
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   Rachael Green, PhD
   Jimmy Choi, PsyD

Neurofeedback Training and Computational Neuropsychiatry for Serious Mental Illnesses

   Co-Authors
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   Michael Stevens, PhD

10:00 AM – 10:50 AM
McCormick Place Room W185a

Symposium: Publication Pitfalls -- Ethical Dilemmas in the Peer Review Process

   Chair
   Michael R. Basso, PhD

Participants
   Julie Suhr, PhD
   Ownership and Authorship
   Lisa Rapport, PhD
   Redos, Reuse, Recycle
   Michael R. Basso, PhD
   The Not So Blind Reviewer

11:00 AM – 11:50 AM
McCormick Place Room W181a

Invited Address: Vonetta M. Dotson, PhD

Neuropsychology in an Aging Word: Is the Field Ready?
PRESIDENTIAL ADDRESS:
MCCREA, M.

Modern Advances in Precision Neurotrauma: Neuropsychology's Vital Role

Applied research over the past 20 years has produced major advances in the basic and clinical science of neurotrauma. In particularly, major progress has been realized in the study of traumatic brain injury (TBI). Pre-clinical studies have illustrated the sequence and time course of pathomechanistic processes in the wake of TBI. Technological advances in functional neuroimaging have created a powerful translational bridge between the basic and clinical science of TBI in humans. Modern studies have deployed advanced neuroimaging to detect changes in brain structure and function following TBI. Recent studies have demonstrated the diagnostic and prognostic promise of proteomic blood biomarkers for TBI, including their prediction of structural brain injury. Finally, prospective studies have provided a clearer understanding of factors that predict recovery and outcome after TBI, as well as more effective means to measure outcome. Together, these breakthroughs pave the way for improved methods for enriching and stratifying TBI patients for clinical trials, as well as creating a platform on which to build a precision medicine model for TBI care. Our ultimate goal, both in pediatric and adult populations, should be the deployment of a precision medicine approach to TBI that accounts for all factors known to influence the acute, subacute, and chronic phases of TBI, and which is harnessed to a multidisciplinary care delivery system. This address will provide an overview of major progress toward a precision medicine model in neurotrauma, with particular focus on advances in brain injury science that inform modern approaches to individualized medicine. The critical scientific and clinical role of neuropsychology will be highlighted.

INVITED ADDRESSES:

BILDER, R.

"Omics" in Neuropsychology – Current State and Future Directions

Scientific investigation of the “Omics” (genomics, transcriptomics, proteomics, metabolomics, connectomics, cognitive and neuropsychiatric phenomics) have burgeoned over the last two decades, carrying the promise that mechanistic paths from “genome” to “syndrome” could be articulated. Initial enthusiasm has been tempered by the complexities involved in spanning levels of analysis. Sobering examples reveal that structural genetic variation explains only a fraction (~25%) of the variance in transcription, and that genetic variants typically explain less than 0.5% of more complex phenotypes, including psychological and neuropsychological phenotypes. Now that whole genome sequencing (WGS) is being conducted on a large scale, and both bioinformatics and healthcare informatics strategies are assembling knowledge and enabling the study of associations across levels of biological processes, we have new opportunities to test hypotheses about the causes of complex disorders of brain and behavior. This process requires new tools for the specification of constructs connecting neural circuits and systems with cognitive and emotional functions. Computational approaches are emerging that go beyond formal descriptions of behavioral outcomes in response to stimulus contingencies, and begin to specify testable hypotheses about mechanistic neural models of cognitive function and dysfunction. The NIMH Research Domains Criteria (RDoC) initiative is evolving to support definitions of new phenotypes that are more closely aligned with neural substrates, holding the ultimate promise that the causes of complex syndromes will be better understood and targeted, personalized treatments will be developed. Neuropsychology is uniquely positioned at the
interface of brain and behavior, where the most profound discoveries about the “mind-body” problem may one day be revealed.

BELLGOWAN, P.
Paths Forward in Neuroscience – A Perspective from NINDS
Over the past decade neuroscience research has grown to be among the largest programs at NIH. The National Institute for Neurological Disorders and Stroke (NINDS) is the lead NIH Institute for neuroscience research with a state mission to “to reduce the burden of neurological diseases through research”. However, NINDS also focuses on understanding the basic principles of neuroscience and has multiple programs to bridge the translational gap that has proven to be one of the great challenges in biomedical research. In the area of Traumatic Brain Injury (TBI), NINDS along with other federal agencies have developed a coordinated research plan that is on the leading edge of moving neuroscience research toward a more open and collaborative path. The TBI research plan emphasizes intra- and international collaborative science, data dictionary standardization, limited-access data sharing, emphasis on the development of biological measures for diagnosis, prognosis, pharmacodynamic, and predictive biomarkers, and coordination of pre-clinical and clinical research efforts all in an attempt to accelerate understanding of TBI and reduce burden. Success of the TBI research model requires coordination and planning by funding agencies but also requires several cultural changes with the TBI biomedical research community. These cultural changes involve both individual and institutional changes that provide incentives for open and collaborative research. This talk will provide a details of the TBI-research plan which, if successful, will serve as an exemplar path forward for neuroscience research.

CHOPRA, S.
Therapy-Induced Brain Reorganization Patterns post Traumatic Brain Injury: A Randomized Control Trial
Objective: Traumatic Brain Injury (TBI) incapacitates nearly 3.5 million in India and can result in a host of issues including physical, cognitive, social, emotional and behavioral. Despite its utility, cognitive rehabilitation is not able to reach most of the affected individuals, which could be because of lack of awareness, trained manpower and high cost of treatment. An economical, home-based, standardized neuropsychological rehabilitation intervention may assist in faster recovery. Functional Magnetic Resonance Imaging (fMRI) along with neuropsychological assessments may give extent of recovery and can aid in assessing efficacy of an intervention. Method: The study followed an open label superiority, single-blind randomized controlled clinical trial with a parallel group design in a tertiary care center. It was initiated after obtaining ethical approval of institute human ethics committee (IESC/T-14/03.01.2014) and the Clinical Trials Registry of India clearance (CTRI/2014/04/004555). In Phase I, a six-week indigenized literacy-free cognitive intervention RETRACE© - Rehabilitation of Eclectic Cognitive Functioning post-Traumatic Brain Injury to Retrain and Restore Attention, Concentration, Memory and Executive Functions was developed. In Phase II, 49 patients aged between 18-45 years, both genders, within one month post Mild or Moderate TBI were randomly assigned to the control group (CG) or intervention group (IG). While the IG was given the 6week intervention, the CG was given treatment-as-usual. The study group was evaluated on various neuropsychological outcome measures and fMRI tasks for working memory and visual memory. Assessments were done at baseline, six weeks after baseline, three months and six months after
the intervention. Results: RETRACE© was useful in improving the overall memory, episodic memory, working memory, executive functioning, response speed, mental status, and aided in reducing the post-concussive symptoms, anxiety symptoms and quality of life both immediately and six months after the intervention. The fMRI findings revealed focused and specific activations in the right anterior cerebellum, bilateral medial frontal gyrus, left declive and right middle temporal gyrus, which are areas known to be responsible for attention, working memory, executive function, language and visual processing post intervention, while the controls exhibited hyperactivation which signifies cognitive overload. Conclusion: A holistic neuropsychological intervention helps in improving the cognitive and psychological issues after brain injury. The caregiver(s) play a significant role in the home-based rehabilitation. Neuropsychological interventions not only help in improving the subjective and objective deficits, but also have a significant role to play in the neurobiological activity and enhancement after injury, validating clinical utility. Functional imaging can provide the link between cognitive rehabilitation and neuroplasticity in larger future cohorts.

DOTSON, V.

**Neuropsychology in an Aging Word: Is the Field Ready?**

By 2060, the number of individuals aged 65 and older in the U.S. is projected to double from 46 million to over 98 million. Psychologists are increasingly playing an important role in the psychological care of this growing segment of the population. This is particularly true for neuropsychologists given normative cognitive changes in late life, the age-related increase in risk for mild cognitive impairment and dementia, and the association of age with other risk factors for cognitive decline. In July 2018, APA released the Technical Report for Psychologist Workforce Projections for 2015-2030: Addressing Supply and Demand, which identified the older adult population (i.e., 65 years and older) as having the largest projected demand for psychologists by 2030. However, psychologists, including neuropsychologists, often have limited training in aging to prepare them to confront the demands and challenges in working with older adults. This presentation will discuss pressing issues that should be addressed in order for the field of neuropsychology to meet the needs of an aging population. This will including training needs and resources across career stages, ethical considerations, and the impact of intersections of diversity in practice and research with older adults.

POSTAL, K.

**Testimony That Sticks: The Art of Communicating Psychology and Neuropsychology to Juries**

How do we create access to complex, highly technical psychological and neuropsychological opinions that are outside of jurors’ framework of understanding in a way that is engaging, understandable, and (to quote Faulker) sets the truth on fire?

This presentation shares the fruits of 4-years of in-depth interviews with seasoned forensic neuropsychologists and psychologists, as well as attorneys and judges, presenting compelling analogies, metaphors, and succinct explanations of assessment processes and findings, as well as principals of productive expert testimony for direct and cross examination.

At its heart, the workshop is about disrupting the academic communication style learned in our years of scientific training that results in a net loss of our ability to communicate clearly and simply about the neuroscience we love. It is about shedding jargon, giving ourselves permission to allow emotion to creep back into our language, freeing up our body language, and using vivid,
clear, language allows us to create moments of genuine, productive communication with jurors
and other triers of fact.

SABSEVITZ, D.
Use of Technology to Enhance the Delivery of Neuropsychological Services in the
Operating Room
Technological advances have been occurring at a rapid pace in recent history. While most of
medicine has effectively embraced this technological revolution, the field of Clinical
Neuropsychology has been very slow to incorporate technology into its practice. In fact, most
neuropsychologists continue to use paper and pencil tests that have not changed in form or
conceptual sophistication over the decades. The lack of technological incorporation threatens our
relevancy and limits our ability to forge new pathways for clinical development and opportunity.
One area primed for greater neuropsychological involvement and in need of methodological
refinement is intraoperative brain mapping. Electrical stimulation (ESM) has been around since
the early 19th century and remains the gold standard in surgical mapping and in many cases
ultimately guides surgical decision making. Cognitive testing during ESM is, however, limited in
several ways. Testing tends to be very basic in method, unidimensional in scope of assessment,
and lacking in individualization to account for patient characteristics. Further, using traditional
neuropsychological methods in the OR impede efficiency, and limit the ability to obtain more
sensitive behavioral metrics in real time. This presentation will review the development of a
novel computerized testing platform designed for extra- and intra-operative brain mapping that
through the use of technology addresses current limitation of the method. Case examples will be
used to highlight the advantages of using this technology to enhance clinical care.

VANDERPLOEG, R.D.
Interpreting Scores in the Context of Syndromes, Brain-Behavior Relationships, and
Clinical Course
All too often low neuropsychological test results are reified as if the score, in and of itself,
reflects an objective reality. Low scores are commonly interpreted as impaired and reflecting
brain dysfunction, even when there is contradictory information. For example, if three memory
measures are administered and performance on two are problematic, while scores on the third are
clearly intact, does that mean that since the majority of scores are impaired, memory must be
impaired in some fashion? This presentation will emphasize the importance of examining
whether test results are consistent with a pattern of findings that reflects an underlying brain
syndrome or a clear brain-behavior relationship. Similarly, findings must be examined in the
context of whether they are consistent with established clinical course of the hypothesized
neurological, medical, or psychological condition.

FELLOW ADDRESS:

DUFF, K.
When Two in the Bush Might be Better than One in the Hand: The Value of Practice
Effects
Practice effects due to repeated testing and multiple administrations of similar cognitive
measures are typically viewed as ‘nuisance variables’ that have to be dealt with statistically or
interpretatively. In this presentation, Dr. Duff will describe studies from his laboratory on short-
term repeated cognitive testing and demonstrate how practice effects, instead of being a
nuisance, provide valuable information about the diagnosis, prognosis, and pathology in
Alzheimer’s disease.

RESEARCH AND EARLY CAREER Awardees:

D. Levitt Early Career Award

SPERLING, S.

Cholinergic Nucleus 4 Density and Early Cognitive Decline in Parkinson disease

Background & Objectives: Degeneration of the nucleus basalis of Meynert (NBM) can lead to
the loss of cholinergic innervation to the neocortex and dementia in Parkinson disease (PD).
Although the NBM cannot be measured using brain MRI, probabilistic maps of the basal
forebrain nuclei can be used to measure cholinergic nucleus 4 (Ch4), which includes the
cholinergic neurons of the NBM. Our objective was to evaluate whether cholinergic Ch4 density
was associated with cognition in two PD cohorts, one with early and one with advanced disease.

Methods: We first analyzed retrospective data for 125 advanced PD patients who had
evaluations prior to a first neurosurgical procedure to treat their motor symptoms.
Neuropsychological tests administered as part of their pre-surgical evaluation were assigned to
one of five cognitive domains: attention, which included working memory and processing
speed, memory, language, visuospatial, or executive. Standardized scores for all tests were
converted to z-scores and then averaged for each domain within subjects. Second, we analyzed
neuropsychological test scores for 228 participants with PD and 99 healthy controls from the
Parkinson's Progression Markers Initiative (PPMI). For both cohorts, Ch4 density was
determined by applying a probabilistic map of basal forebrain nuclei to MP-RAGE T1
sequences processed using voxel-based morphometry methods. The relationships between Ch4
density and cognitive scores were analyzed using correlation coefficients and linear regression
models.

Results: In the pre-surgical PD cohort, Ch4 density was significantly correlated with Montreal
Cognitive Assessment (MoCA) scores (rs=0.27, p=0.007) and a significant predictor of MoCA
scores after adjusting for age and sex (β=14.2; 95% CI=1.5, 27.0; p=0.03). In a linear
regression model adjusted for sex, Ch4 density was a predictor of attention (β=3.2; 95%
CI=0.83, 5.5; p=0.008) and visuospatial domain z-scores (β=7.9; 95% CI=2.0, 13.8; p=0.009).
Ch123 and neocortical densities were also significantly associated with these cognitive scores.
In the PPMI cohort, in participants with PD at baseline, Ch4 density was correlated with
MoCA scores (rs=0.17, p=0.01) and a significant predictor of MoCA scores after adjusting for
age and sex (β=9.2; 95% CI=1.9, 16.5; p=0.01). In linear regression models adjusted for sex,
greater Ch4 density predicted better performances on the Judgement of Line Orientation
(β=20.4; 95% CI=13.8, 27.0; p<0.001), Symbol Digit Modalities Test ((SDMT; β=41.8; 95%
CI=18.7, 65.0; p<0.001)), and WAIS-III Letter Number Sequencing (β=16.5; 95%
CI=9.5,23.4; p<0.001) tests. Ch4 density, and not Ch123 or neocortical densities, was
associated with MoCA and SDMT scores. There were no associations between Ch4 density
and cognitive scores in healthy controls. In the 97 participants with PD and 4-year follow-up
data, Ch4, Ch123, and neocortical densities were significantly associated with all cognitive test
scores.

Conclusions: In both de novo and more advanced PD, greater Ch4 density was associated with
better performance on a global cognitive screening measure and tests of visuospatial
functioning and attention/processing speed. Early degeneration of Ch4 uniquely contributed to
deficits in performance on tests of global cognition and processing speed. These results suggest
that in early PD, Ch4 density may be viable surrogate imaging biomarker of cognition.
Established Faculty Blue Ribbon Award Winner
HAN, D.
Perceived Discrimination in Older Black Adults is Associated with Insula Functional Connectivity

Early Career Faculty Blue Ribbon Award Winner
THOMAS, K.
Cognitive Training Increases MCI-to-Normal Reversion Rate in the ACTIVE Study

Student Blue Ribbon Award Winner
JEAN, K.
The Differential Effects of Education on Functional Status Based on Genetic Risk

Student Translational Neuropsychology Blue Ribbon Award Winner
KIM, A.
The Clinical Utility of Functional Near Infrared Spectroscopy in Children with ADHD

Student Minority Blue Ribbon Award Winner
XIA, Y.
Distinguishing Amnestic MCI Subtypes in Older Adults via Screening versus Expanded Memory Tests

Student Evidence Based Practice Blue Ribbon Award Winner
HARDT, B.
Working Memory as a Mediator of the Relationship between Education and Phonemic Fluency

Student Cross-Cultural Neuropsychology Blue Ribbon Award Winner
PIAZZA-RODRIGUEZ, A.
Exercise Predicts Memory Performance over Time among Older Latinx Adults

SYMPOSIA AND SKILL-BUILDING WORKSHOPS

Symposia

SCHAEFER, L.A. (CHAIR), SHMIDHEISER, M.H., TUSSEY, C.M., YOCHIM, B.P., LICHTENBERG, P.A.
An Integrative Approach to Capacity: Philosophical, Ethical, Forensic, and Diversity Issues
Capacity implies the ability to exercise free will and make an informed decision. It is a topic which arose from ethics, law and philosophy and is compelling from both a theoretical as well as practical perspective. Decisional capacity is increasingly relevant for psychologists, as we are frequently called upon to assess capacity, whether in a medical or forensic context. It is anticipated that this need will become even greater as the population ages. In this collaborative presentation, capacity will be discussed from various approaches by psychologists working in both clinical and research settings. Different approaches include theoretical and philosophical issues such as voluntarism; a review of ethical principles including competences and human relations; and the forensic psychology viewpoint, including applicable legal standards and how
to communicate with attorneys. There will also be considerable time dedicated to diversity concerns when assessing capacity, including empirical data, case studies and potential ethical dilemmas. Topics covered include cultural bias and the assessment of ethnically and racially diverse populations, and the prevention of exploitation in elder minority groups. This symposium integrates various approaches to capacity and provides a useful and thought-provoking background for those interested in working in this area.

(1) Theoretical perspectives on voluntarism, decision-making and informed consent
Voluntarism, and its constituent decision-making abilities, are key components of informed consent. Currently, mental health professionals commonly hold to the perspective that human volition can be diminished and compromised by numerous means, e.g., in cases of severe brain injury, advanced dementia, and instances of severe mental illness. A primary issue for consideration, to be examined briefly in this presentation, is what are the implications for decision-making impairments for informed consent. Present-day theoretical perspectives on voluntarism typically align with a legal or ethical theoretical view on the matter. The disparate conceptualizations of the theoretical and ethical views can lead to different implications for how clinicians, in the process of obtaining informed consent, view and address issues related to voluntarism and compromised decision-making ability.

(2) Ethical Themes and Concerns Related to Capacity
Ethics and moral values underlie the entire concept of decision-making capacity and consent, particularly the respect for autonomy and self-determination. Further, as psychologists, we are governed by the APA Ethical Principles and Code of Conduct in our evaluation of capacity in our patients and clients. This presentation will first examine the broader ethical issues with regard to capacity, and then will review specific principles that apply to psychologists who are confronted with these questions. In particular, standards pertaining to professional competences, the use and bases of assessment, and human relations are pertinent to this work; the latter includes collaboration with other professionals, avoiding conflicts of interest and coercion, as well as maintaining cultural sensitivity.

(3) Capacity: A forensic psychologist’s perspective
Attorneys and judges often call upon psychologists to assist with evaluation of capacity. However, legal professionals speak a very different language. In this presentation, capacity will be discussed from the point of view of a board certified forensic psychologist who routinely works with legal experts on such issues. Goals of this talk include differentiating capacity from competency; describing the legal standards of different types of capacity (such as testamentary capacity); and defining diminished capacity as it pertains to guardianship. Relevant case law will be discussed, and illustrative case examples will be included to highlight reasons for referral, and strategies for how to most effectively work with attorneys and the legal system.

(4) Considerations of ethnic diversity when determining capacity to make medical decisions
This presentation will provide an overview of capacity assessment in medical settings and discuss ethical challenges that arise, particularly when assessing patients from ethnic backgrounds different than one’s own. One frequent ethical dilemma involves the desire to avoid imposing the practitioner’s cultural values upon an assessment of a patient, balanced with the goal of circumventing harm. Psychologists working with patients from different ethnic backgrounds must work to avoid having cultural bias influence their determinations of whether patients have capacity to assist with disposition planning. Another challenge in the assessment of capacity is that racial and medical mistrust may lead to patients having difficulties trusting medical personnel. This mistrust can especially be activated when one’s right to self-
determination, such as the wish to return to one’s home, is being evaluated by medical personnel from the majority ethnic group. Capacity evaluations typically include some assessment of the patient’s cognitive functioning. Psychologists in medical inpatient settings are also challenged by the shortage of appropriate brief measures to use for evaluating cognitive functioning in frail patients from diverse ethnic backgrounds. This presentation will explore ethical dilemmas and other challenges that arise in medical capacity assessment, particularly in patients from ethnic minority backgrounds. Case examples will be used to illustrate key points, and an overview of the research to date will be presented. Strategies to use for ensuring a valid assessment will be discussed.

(5) Intersection of Financial Decision-Making deficits and Exploitation in Older Urban African Americans
Financial exploitation of older adults has been called the “crime of the 21st century”, however, most studies on the topic have a low representation of African Americans. Financial capacity has been studied across the past 20 years through tools such as Marson’s Financial Competency Inventory. This tool, while extremely sensitive to cognitive change, has no items to assess real world financial decision making. In creating the Lichtenberg Financial Decision Screening and Rating Scales we sought to create measures that would focus on real world actual decisions and measure informed decision making. One of our hypotheses was that there would be an intersection between financial decision making deficits and financial exploitation particularly among those older adults experiencing some cognitive decline.

We conducted reliability and validity studies separately for our screening and rating scales. Our samples of over 600 have included 325 African American older adults. Overall, we found evidence for our hypothesis that financial decision making capacity and financial exploitation intersect. This intersection was most pronounced among those with evidence of some cognitive decline. Urban African American older adults, living in a Midwest city where 60% of older adults are economically insecure, were well represented. The major decisions our sample of African Americans were making included major purchases, debt reduction and bankruptcy and making major gifts to family. We will discuss research findings and use case studies to illustrate our findings.

HOOK, J.N. & GERSHON, R. (CHAIR), TULSKY, D., WEINTRAUB, S.
Examining the Clinical Utility of NIH Toolbox for Use with Adult and Older Adult Neurologic Patients
The NIH Toolbox is a suite of Cognition, Motor, Sensation and Emotion measures which can be administered through an iPad app. Capitalizing on the digital interface, many of the NIH Toolbox tests use computer adaptive testing allowing for speed of assessment without the loss of psychometric precision. When first released, users were cautioned to use these instruments predominantly for research purposes. Since that time, there have been numerous published validation studies supporting the use of these instruments in various clinical populations. This symposium reviews and synthesizes published and ongoing research seeking to validate the clinical and research use of the NIH Toolbox in neurologic impairments including adults and older adults with Traumatic Brain Injury, Mild Cognitive Impairment, and Alzheimer’s Dementia. Advances in the NIH Toolbox and future directions are discussed.

(1) NIH Toolbox: Overview and History
The NIH Toolbox (NIHTB) consists of multiple tests in four domains: Cognition, Motor, Sensation, and Emotion. Each test takes 5 minutes or less to administer and the tests are
generally available for use from age 3-85 years. The test battery was developed under contract from the NIH Blueprint for Neuroscience Research and ultimately involved a team of more than 250 scientists and clinicians from nearly 80 academic institutions. A norming exercise used a national demographically balanced sample of 4,859 participants, including a dedicated sample of Spanish speaking participants who were administered a Spanish version of all of the measures. The iPad App version of the NIHTB was released in 2015 and no internet connection is needed for test administration. Score reports and data exports give raw-and normative- scores per test; composite scores are available for Cognition and Emotion Domains. The ease of use and low-cost has allowed for many research groups and clinicians to incorporate the NIHTB into their assessments. In fact, since its initial release in 2012, the NIH Toolbox has been used at more than 800 institutions, in over 133 Clinical Trials, and has appeared in over 200 publications. We will review both our ongoing research as well as published data by other groups to examine the effectiveness of the NIHTB as an assessment measure in adult and older adult neurologic patients.

(2) NIH Toolbox Use in the Assessment of Traumatic Brain Injury
When the NIH Toolbox for Assessment of Neurological and Behavioral Functioning was published, the developers of the NIH Toolbox Cognition Battery (NIHTB-CB) pointed out that while the NIH Toolbox has several potential applications for clinical research, it had not been validated for clinical use. In a large, multisite study conducted at 3 rehabilitation medical centers, individuals with traumatic brain injury (TBI; N = 187) were administered the NIHTB-CB along with other neuropsychological tests and several patient reported outcomes measures. These data were used to evaluate convergent and discriminant validity in a TBI sample. Additionally, a sample with no known neurological impairments, matched on key demographic variables (age, education, gender, and race/ethnicity) to the TBI sample, which completed the NIHTB-CB (extracted from the NIHTB-CB normative sample) served as a control group. This allowed direct comparison among individuals with mild/moderate TBI, severe TBI, and control groups, further demonstrating the construct validity of the NIHTB-CB. Furthermore, the sensitivity and specificity of the NIHTB-CB in TBI was calculated, and base rate frequency data could help clinicians determine if observed performance was unusually rare in individuals with TBI. Collectively, these data suggest that the NIHTB-CB provides a reliable and valid assessment of the cognitive challenges that are associated with mild, moderate and severe TBI. Moreover, such data are vital to clinicians to use the NIHTB-CB in clinical practice when testing individuals with TBI.

(3) NIH Toolbox Use in the Assessment of Mild Cognitive Impairment and Alzheimer’s Disease
The NIHTB was designed to measure the normal range of ability in the domains of Cognition, Motor Functions, Sensory Functions and Emotion in individuals 3 to 85 years of age and to be used in longitudinal research studies. Clinical validation of the NIHTB has been undertaken in a variety of neurologic diseases. Perhaps one of the issues currently of greatest concern for public health is the detection of cognitive decline in older individuals, particularly as it relates to diseases, such as Alzheimer’s, that cause dementia. Alzheimer’s is anticipated to increase in prevalence as the aging population grows in the US and other developed countries. To assess the utility of the NIHTB in the detection of age-related cognitive impairment that signals disease, a three-year, longitudinal study (Advancing Reliable Measurement in Alzheimer’s Disease and Cognitive Aging, ARMADA) has been undertaken to validate the NIHTB in individuals between 65 and 85 who are cognitively healthy, or who have symptoms of mild cognitive impairment.
(MCI), or of early dementia of the Alzheimer type. Additional samples for validation include a cohort of cognitively healthy older adults over age 85 to extend the age range of the current normative sample; samples of African Americans in the relevant clinical groups; and a sample of Spanish speaking Hispanic individuals for validation of the Spanish version of the NIHTB. The study will compare baseline characteristics of the clinical groups and will also conduct two annual longitudinal follow ups in healthy controls and those with MCI to study the ability of the NIHTB to predict future decline. Emphasis is placed on studying individuals with available biomarkers of Alzheimer’s disease, including amyloid imaging, cerebrospinal fluid markers of amyloid and tau, and carrier status for the risk factor gene for apolipoprotein E in order to discover behavioral features related to biomarker positivity.

(4) NIH Toolbox: Advances and Future Directions

The NIH Toolbox (NIHTB) is currently being used in over 900 academic and clinical institutions. While originally released primarily as a research tool, the evidence presented during this session clearly supports clinical use for many diseases and conditions, in a variety of settings. The NIHTB is a normed measurement system and we recognize that there is an expectation and a responsibility to update test content and norms, particularly for clinical applications. To this end, we are actively field testing and validating modifications of the current NIHTB measures to raise the floor, lower the ceiling, and/or improve the accuracy for some measures. We are also field-testing new measures to extend the domains covered by the NIHTB to be more in line with contemporary measurement theory. Accordingly, we are adding: 1) a measure of associative memory which has been correlated with measures of brain amyloid burden in cognitively healthy individuals and lowering the floor and raising the ceiling of the picture vocabulary test with new items; 2) a test of near vision to confirm that even those with corrected vision can see the measurement stimuli; 3) a measure of pure tone audiometry to cover traditional hearing concerns (the NIHTB already contains a Word in Noise task; 4) a non-verbal (matrix) reasoning test; and 5) we are seeking to lower the floor and raise the ceiling of our executive functioning tasks (Flanker and DCCS). While we conducted studies to assess the relationships between the web-based version of the measures and the iPad App versions we will seek to re-norm the entire battery, administered on iPads to match the 2020 US census.

HUGHES, A. (CHAIR), LISDAHL, K., MADORE, M., EHDE, D.
Balancing Your Life: Perspectives on Navigating Professional and Personal Challenges

Many professional women are confronted with the challenge of balancing work-related responsibilities, responsibilities at home, and the important need to take care of themselves. In this interactive program, audience members will be asked to submit questions as they enter the room. Panel members will describe factors that affect work-life balance and discuss the process of prioritizing and cultivating actions that optimize balance. The search for balance based upon personal style and in the context of changing and evolving life demands and choices will be discussed. Guidance and advice will be presented from evidence-based sources and from personal challenges and perspectives. In the second half, audience members will receive more focused and personalized guidance and advice as the panel members respond to the audience members’ questions.

(1) Striving for balance and sanity when you are in the "sandwich" generation

Striving for a work-life balance as a psychologist is an on-going process, and there is no one-size fits all strategy. Dr. Lisdahl, a clinical neuropsychologist, will discuss factors that have been shown to predict work-life balance in psychology and other professions. She will discuss her
personal experience in balancing a busy research career, while being a single parent and caregiver for ill parents. Specifically, she will discuss first developing awareness of your personalized work style, then building a career around that style to optimize opportunities for balance. For example, do you work best in a structured environment with stronger boundaries around the work day, or is your style more in spurts of activity followed by down-time? Factors that may impact work-life balance that Dr. Lisdahl will discuss include: individual (e.g., emotional regulation, stress management, work engagement, self-care), interpersonal (e.g., conflict management, mentoring), work load, and environmental factors/support (e.g., flexibility of hours and location, commute time).

(2) Can the perfect balance be achieved?
While we like to think work/life balance is something which may be achieved, in reality it is not. It is an ongoing process where we are re-evaluating our needs and values in hopes of making decisions which are consistent with our priorities in a given point in time. Depending on where we are in our personal lives and our professional development, our priorities change. As a result, our response to a particular situation will vary based on our priorities at that time.

(3) Fostering individual wellness: Evidence and advice
Individual wellness – physical, emotional, social, and spiritual - is vital to the personal and professional fulfillment of every psychologist. However, work, family, and other responsibilities frequently supersede personal wellness. Wellness can also be negatively impacted by the persistent gender disparities in pay, promotion, funding, and leadership opportunities that women in academia, healthcare, and other professional settings too often face. In this presentation, Dr. Ehde will briefly summarize the evidence on the importance of personal wellness to optimize work-life balance and highlight a few key strategies for prioritizing personal wellness in the midst of competing professional and personal priorities. Recognizing the importance of others in promoting wellness and addressing gender disparities, Dr. Ehde will also discuss strategies for cultivating mentors, peers, and communities that support and advocate for women’s wellness and work-life balance. In doing this, she will highlight a few current movements within academia to support women’s wellness and advocate for gender equity. She will also draw from her experience as co-director of a postdoctoral research fellowship program as well as a clinician-scientist who has had to learn negotiation skills, the importance of self-advocacy, and the importance of saying no along the way.

HERMANN, B. (CHAIR), LUBBERS, L., JONES, J.J., BINDER, J.
Redefining the Taxonomy of Disease: The Case of Epilepsy
The purpose of this symposium is to overview and provide new perspectives of the etiology of neurobehavioral comorbidities and outcomes of epilepsy, the 4th most common neurological disorder. As is the case in many medical disorders, efforts are ongoing to characterize the presence, rate and causes of common complications or comorbidities of epilepsy (e.g., cognition, behavior, social function) as well as expected outcomes of interventions (e.g., medications, surgery). These efforts are classically conducted through the lens of the medical taxonomy of the disease. For epilepsy, comorbidities and outcomes have been examined largely as a function of the international classification of seizures and epileptic syndromes, as well as major treatment outcomes for the disorder, such as seizure frequency. It is becoming increasingly clear that specific phenotypes of comorbidities and treatment outcomes exist independent of the overarching medical taxonomy, contributing to a more personalized medicine approach to the disorder. This collaborative symposium will provide an understanding of the epilepsies from
multiple perspectives, overview what is known and provide new insights into meaningful phenotypes of neurobehavioral and treatment outcomes. The symposium will begin with an overview of the public health significance of epilepsy (Dr. Laura Lubbers, Scientific Program Officer, Citizens United for Research in Epilepsy [CURE], Chicago IL), followed by an review of the lifespan neuropsychological (Dr. Bruce Hermann, University of Wisconsin) and psychiatric complications (Dr. Jana Jones, University of Wisconsin) which will be examined both cross-sectional and longitudinally in children and adults with epilepsy. Finally, the cognitive and medical outcomes of surgery to treat medication resistant epilepsy will be reviewed (Dr. Jeff Binder, Medical College of Wisconsin).

(1) The Personal and Public Health Challenges of Epilepsy
Epilepsy is a major public health problem. As the 4th most prevalent neurological disorder, it affects 3.4 million Americans and 65 million people worldwide, affecting individuals throughout the lifespan. The national response to the epilepsies by private and public organizations to address the challenges posed by epilepsy to public health will be overviewed, setting the stage for the presentations to follow.

(2) Psychiatric CoMorbidity in Children and Adults with Epilepsy
Changes in mood and behavior in children and adults with epilepsy have been of longstanding interest with etiological theories ranging from biological (e.g., epilepsy syndrome) to psychosocial (reactions to stigma, psychosocial stresses). In this presentation, cross-sectional and longitudinal monitoring of DSM disorders will first be presented and identified psychiatric phenotypes will be related to underlying neurobiology. Again, application of network science demonstrates the anomalies in large scale neural networks associated with these phenotypes.

(3) Lifespan Neuropsychology of Epilepsy
A major comorbidity of the epilepsies in children and adults is altered neuropsychological status. Epilepsy in youth can impact normal neurodevelopmental processes and in adults it can impact the course of cognitive and brain aging. Interest has long focused on the relationship of clinical disease factors (epilepsy syndrome, seizure frequency/severity) which has been the clinical and research trend for decades. Here we will demonstrate that specific cognitive phenotypes exist in both children and adults with epilepsy that are associated with anomalies in underlying neurobiology what are clarified by application of network science to imaging modalities, the phenotypes of predictive significance for both development and aging.

(4) Epilepsy Surgery Outcome: Seizures and Language
The outcomes of medical treatments for epilepsy, including epilepsy surgery, on seizure frequency and cognition are of international interest. Considerable variability in outcomes are observed even when standard surgical procedures are applied to a homogeneous group of patients (e.g., mesial temporal lobe epilepsy) suggesting the presence of underlying phenotypes with differential responsivity to interventions. This variability is important to understand and will be addressed in this presentation with a focus on seizure and language outcomes following epilepsy surgery.

Developing New Methods of Assessing Performance Validity
Performance Validity Tests (PVTs) have become widely used by neuropsychologists (Sweet et al., 2016) and standard of practice (Heilbronner et al., 2009). The past 20 years have seen a proliferation of PVTs with the most commonly used methodology being forced-choice measures
that resemble memory tests. For example, the Test of Memory Malingering (TOMM, 1996) and the Word Memory Test (WMT, Green 2005) are two common PVTs that utilize this format. Unfortunately, as the use of PVTs has increased, so has awareness about these measures which has led to increasing concerns that examinees are coached on how to pass the measures (Brennan et al., 2009). Additionally, many embedded PVTs have also been developed, which are PVTs included in pre-existing cognitive measures varying levels of sensitivity to non-credible performance while maintaining appropriate levels of specificity. These measures are more diverse and include measures of attention/working memory (Reliable Digit Span, Young et al., 2012), visual spatial (Rey Complex Figure Test-Copy trial, Whiteside et al., 2015) and executive functioning (Wisconsin Card Sorting Test Failure to Maintain Set; Greve et al., 2009). The major drawback to many of these measures is the low sensitivity to non-credible performance (Schutte & Axelrod, 2013). This symposium discusses research into innovative PVTs designed to address these shortcomings. Specifically, the symposium’s goal is to introduce embedded and free-standing PVTs that have improved sensitivity for the detection of non-credible performance. Dr. Basso and his student Jordan Hoffmeister present new research on two existing visual-spatial measures that are repurposed as a PVT, while Dr. Gaasedelen describes the development of a FBS-type scale for the PAI designed to detect cognitive response bias. Dr. Rapport discusses her lab’s research incorporating biometrics into traditional PVTs. Dr. Whiteside is the moderator and Dr. Suhr is the discussant.

(1) Biometric Enhancements of Performance Validity Tests
Biometric data can be sensitive markers of cognitive impairment after traumatic brain injury (TBI); moreover, distinct patterns of biometric data are known to characterize decision-making and effort among healthy adults. Biometrics have been used successfully in experimental contexts to describe phenomena associated with neuropsychological conditions; however, they have not been widely applied clinically in the context of performance validity tests (PVTs). Our research lab has investigated the incremental utility of three types of biometric data linked to traditional PVTs: item-level response time, oculomotor behavior (eye-tracking), and pupillometry. The central hypothesis is that biometric behaviors accompanying the selection of responses, especially those that are not under conscious control, differ between individuals who put forth genuine effort and those feigning cognitive impairment. We will review the theoretical grounds and empirical findings for biometric data in the context of performance validity testing, as well as offer some critical evaluation of advantages, disadvantages, strengths and weaknesses for each of these three types of biometric technologies. Thus far, our research and others generally supports the concept that purposeful dissimulation of TBI involves increased cognitive effort, and this phenomenon is captured in various biometric indexes. Some of the critical issues involved in incorporating biometrics into standard clinical practice will be addressed, such as feasibility for average clinicians to incorporate the technologies; potential robustness to conscious control; caveats regarding known-groups research design, standardization, and development of normative data; and the potential for selection bias embedded in some of the technologies. Despite numerous unknowns going forward, the addition of biometric data to clinical tests shows promise as a unique solution to the longstanding challenge of performance validity assessment. Additionally, research in this area will increase knowledge about disruptions of motivation and effort in TBI.

(2) The Perceptual Memory Test: Initial Validity of a Novel PVT
Objective: Perceptual memory is a form of implicit memory, and may be robust to brain damage that affects explicit memory. As such, a perceptual memory task (PMT) may function as a
performance validity test (PVT). The present study compared the PMT to the Word Memory Test (WMT) and the Test of Memory Malingering (TOMM).

Participants and Methods: The PMT involves stimuli from the Mooney Closure Test, a measure of visual perception. It includes 15 degraded images of common objects. Participants attempt to identify the images. Regardless of their accuracy, they are shown an overlay that clearly articulates the object. Three and fifteen minutes later, recall of the images was tested. A forced choice recognition trial follows.

Participants included healthy undergraduates who were administered the California Verbal Learning Test-2 (CVLT-2), WMT, TOMM, and PMT. 15 participants were directed to provide their best performance. 57 were provided information concerning mild traumatic brain injury (mTBI), and were directed to simulate symptomatic performance.

Results: The simulator group performed worse on all measures. PMT scores correlated with the TOMM and WMT (.69 to .86). A receiver operating characteristics analysis revealed areas under the curve ranging from .79 to .97 (PMT), .96 (TOMM), and .96 to .98 (WMT). For the PMT, sensitivities ranged from .71 to .95, and specificities ranged from .96 to 1.00. With standard cutoffs, WMT sensitivities ranged from .81 to .93 and specificities were 1.00. TOMM sensitivities ranged from .79 to .81, and specificities were 1.00.

Conclusions: The PMT achieved discriminant validity that was comparable to the WMT and TOMM. Indeed, its sensitivities for recall indices generally surpassed the TOMM and WMT. These data imply that the PMT holds promise as a novel PVT. Further investigations are necessary to better determine its clinical specificity.

(3) Use of the Gollin Incomplete Figures as a Performance Validity Test (PVT)

The current study evaluated the validity of the Gollin Incomplete Figures Test (GIFT; Gollin, 1961), using a modified administration procedure, as a PVT. The GIFT was implemented as a measure of implicit learning by Warrington (1967) in research concerning patients with hemispheric-localized lesions. Patients with left hemisphere lesions performed as well as healthy controls on the GIFT. As such, the figures may hold promise as a PVT. 74 undergraduates were assigned into a control group (n = 18) or a simulator group (n = 56). The simulators feigned symptoms of a mild head injury. All participants were administered 10 items from the GIFT, the Test of Memory Malingering (TOMM), and the Word Memory Test (WMT). After presentation of the GIFT items, a 3-minute and 15-minute delayed recall was administered. The GIFT correlated with the TOMM and WMT (rs ranging from .67 to .79, ps < .001). Receiver Operating Characteristic (ROC) analyses showed that the GIFT achieved significant AUCs for both trials (AUCs = .95, ps < .001), and were comparable to the TOMM and WMT. Using a criterion of at least 90% specificity, optimal cut scores were identified. Sensitivities ranged from .89 to .95 and specificities ranged from .91 to 95. Using standard cutoff values for the TOMM and WMT, sensitivities ranged from 69 to 80 for the TOMM and 75 to 89 for the WMT, and specificities were 100 for all indices.

Modified administration of the GIFT resulted in a promising novel PVT. Convergent validity was demonstrated with well-established PVTs. Additionally, two indices of the GIFT demonstrated effective diagnostic classification accuracy in identifying head injury simulators from healthy controls. Indeed, sensitivity and specificity was comparable to the TOMM and WMT. Additional research is warranted for development of the GIFT as a clinically useful tool in detecting poor effort.

(4) Construction and Validation of a Novel Neuropsychological Symptom Validity Test for the Personality
When the Personality Assessment Inventory (PAI; Morey, 2007) was developed, it did not include symptom validity scales sensitive to cognitive response bias or non-credible performance. Noncredible performance is defined by failure on performance validity tests (PVTs), such as the Test of Memory Malingering (TOMM; Tombaugh, 1996) and the Word Memory Test (WMT; Green, Allen, & Astner, 1996). The present study set out to construct and validate a new SVT for the PAI that functions in a manner similar to the Response Bias Scale (RBS; Gervais, Ben-Porath, Wygant, & Green, 2007) on the Minnesota Multiphasic Personality Inventory-2-RF (MMPI2/RF). The RBS was also validated using PVT performance as a criterion. The derivation sample included 306 consecutive clinical referrals for neuropsychological evaluation from a multi-specialty group practice. Participants completed at least one free-standing PVT, two embedded PVTs, and the PAI. Participants who failed a free-standing PVT and at least one embedded PVT were classified into the FAIL group (n=49), and all others were classified into the PASS group (n=257). Initial items were selected based on discriminability between groups (akin to the Gervais et al. method), while the final set of items was selected based on Item Response Theory parameters. The items comprising the new SVT showed good ability to discriminate between the PASS and FAIL group (Cohen’s d = -0.96), performed consistent with the RBS on the MMPI-2-RF, with good overall classification accuracy (area under the curve = 0.72) and adequate sensitivity and specificity. The novel SVT was then cross-validated on an independent sample from an academic medical center, where it demonstrated similar psychometric properties and classification accuracy.

SKIERKIEWICZ, A. (CHAIR), POWER, E.M., OSTER, K., RAMOS, E., RICCIO, S.
Why Can't We be Friends: An Integrated Approach to Applied Neuropsychological Services and Training
Everyday neuroscientists make progress in understanding the brain and the relationship it has to our behavior, which has necessitated contemporary applied psychology to integrate knowledge from a variety of disciplines to develop data-driven evidence-based interventions. A panel of professionals from clinical psychology, school psychology, neuropsychology, and forensic psychology will discuss the importance of the interconnectedness of their disciplines and how they integrate their various specialties for more comprehensive student training experiences at both the university level and in applied settings. This panel will demonstrate how we offer a collaborative and integrated model to provide comprehensive doctoral training experiences, including exposure to multiple disciplines, the interconnectedness of community-based services, which models partnership among practicing health-service psychologists. The health-care field is quickly moving toward an integrative model and by training our students in their chosen specialty fields, we are limiting their access to training opportunities. Working together as a group allows our students to have expanded training opportunities that may not otherwise be offered by a single-discipline program. By connecting disciplines at the foundational level this model lends itself to increased treatment coordination and care, and better client access, which undoubtedly will lead to improved treatment outcomes. Participants will leave with a better understanding of how to apply a collaborative and integrated training model across related psychological disciplines that cut across the university and applied settings.

(1) If I Only Had a Brain: School Neuropsychology from a Trainer
There is a growing need for a clinical neuropsychological approach within school psychology systems. As society continues to change, the need for services within schools has also grown. Due to changes in society, especially advances in modern medicine, school psychologists may
not be well equipped to deal with the growing number of psychological and behavioral problems within classrooms. For example, school psychologists are expected to know more about the biological bases of neurodevelopmental disorders. There are an increasing number of medical diagnoses, such as low birth weight that contribute to learning deficits in children of which school psychologists need to be aware. To find individualized supports, it is beneficial for children with disabilities to undergo a clinical neuropsychological evaluation. However, not all students can access neuropsychological supports. School Psychology faculty with clinical neuropsychology background are ideal for training school psychologists to meet the ever-changing needs of their students. Candidates are trained in areas such as the biological basis of behavior, functional neuroanatomy, life span development, and intervention techniques. In order to determine appropriate interventions for specific individuals, these candidates can conduct comprehensive evaluations to better understand distinct cognitive strengths and weaknesses. The results of these evaluations, in conjunction with candidates’ knowledge of development and brain-behavior relationships, lead to recommendations of evidence-based interventions that are designed to increase quality of life in individual students. This portion of the collaboration will focus on the advocacy for extensive training in clinical neuropsychology for school psychology candidates. Participants will leave with a better understanding as to how clinical neuropsychology cuts across everyday tasks of school psychologists, such as consultation, assessment, and intervention implementation.

(2) If I Only Had a Brain: Clinical Neuropsychology from a Trainer
As the field of neuropsychology grows, so too do our understanding and appreciation of the neurological bases of behavior and psychological symptoms and disorders. This has significant implications within other specialties of psychology; from clinical to school to forensic and medical settings. The neuropsychological examination is the foundation for clarification of diagnosis and establishment of treatment protocols for students with learning or developmental disorders, adults with traumatic brain injury, and older individuals with neurodevelopmental diseases. Likewise, it provides explanation for behaviors and the impact of injuries, and provides critical information in legal and forensic cases. The high likelihood of overlap into other specialties, coupled with the potential implications of assessment results, makes quality training of future clinicians crucial. Students are trained to strengthen and apply their clinical knowledge, as well as knowledge of functional neuroanatomy and neuropathology, biological bases of behavior, lifespan development, and intervention techniques to the conceptualization and treatment of neurological and neuropsychological conditions. Training techniques involve intensive one-on-one and group supervision, in-depth case conceptualization and review, and direct interaction with patients based on the students' level of training and understanding. The goal is not to train psychometricians, but rather to train future clinicians to be competent, skilled neuropsychologists capable of functioning in school, medical, forensic, and clinical settings.

(3) An Innovative Model for Student Training Across Disciplines: From University to Applied Settings
Only by understanding the strengths each of our related disciplines bring to the table and what we can learn from each other. In recent years, health care has shifted to an integrated model that connects disciplines with a client-centered approach. Research has shown that effective implementation of a collaborative model drastically improves outcomes for clients while reducing the overall cost of care. Integrating a collaborative approach throughout aspects of student training provides an amalgam to how we students should partner with other health service psychologists. Having experience at both the university level and in applied settings,
including community mental health, private practice, therapeutic day schools, and public schools, this portion of the presentation will focus on how we have drawn from the expertise of supervisors from neuropsychological, clinical, forensic, and school backgrounds to truly create a unique and multifaceted training experience. Students are trained to utilize a model wherein the neuropsychological evaluation is the first step in the treatment process and used to determine diagnostic clarity and treatment recommendations. As such, students from different levels of training and disciplines are involved in an integrated group didactic supervision with students specializing in neuropsychology and therapy are both present. Each case presentation begins with the presenting concerns a discussion of the data, and therapeutic applicability, including school recommendations are discussed based on the evaluation results. Students are also trained as research assistants on forensic neuropsychological cases, which intersects the fields of forensic psychology and neuropsychology. Participants will leave with a better sense of the intersection between neuropsychology and related fields and how to implement a model of collaborative student training.

(4) If I Only Had a Brain: Neuropsychology in the Criminal Justice System
Approaches must be tailored to individual needs because practices that may ameliorate symptoms of certain disorders may exacerbate symptoms of other disorders. Youth in the juvenile justice system suffer from various mental health disorders and co-occurring disorders. Approaches must be tailored to individual needs because practices that may ameliorate symptoms of certain disorders may exacerbate symptoms of other disorders. Although the criminal justice system has implemented several policies to improve sentencing. According to the American Psychological Association (APA), between 60 and 80 percent of youth involved with the juvenile justice system meet the criteria for at least one psychiatric diagnosis. However, research has shown that a high percentage of delinquents that enter the system are misdiagnosed which has major negative implications. Approaches must be tailored to individual needs because practices that may ameliorate symptoms of certain disorders may exacerbate symptoms of other disorders. By expanding the training to include neuropsychological influences and implications on brain behavior relationships, candidates are able to accurately diagnose and provide tailored treatment and interventions that will ultimately increase positive outcomes for the individual. The fact that the physical, social, emotional and cognitive capabilities and characteristics of children and adolescents are in a state of development sets them apart from adults. Participants will leave with a better understanding of the application of clinical neuropsychology in the juvenile justice system by forensic psychologists can improve overall treatment for juvenile offenders.

CHOI, J. (CHAIR), BOSL, W.J., JACOBSON, M.D.A.
New Methods of Diagnosis and Treatment – Digital Biomarkers, Brain Stimulation, and Neurofeedback
This symposium looks to the future of neuropsychological assessment and treatment by showcasing a new generation of technology-driven advancements. In a seminal study of neuroinformatics and digital biomarkers, novel EEG technology and analytics developed by Dr. Bosl, a data scientist and health informatics expert at USF and Harvard, capture brainwave data in infants to make predictions regarding autism diagnosis and identify changes in developmental trajectory. Major Jacobson, the director of neuropsychology at Wilford Hall Ambulatory Surgical Center, the U.S. Air Force’s flagship medical facility for outpatient care, discusses how brain stimulation techniques can impact the regulation of glucocorticoids to enhance cognition in
military personnel. Dr. Choi, a psychosocial rehabilitation clinician at a private hospital, introduces a new pupillometry-based neurofeedback cognitive training program for psychosis that incorporates the computational depictions of neurophysiologic function and its clinical utility. This intersection of neuropsychology and technology highlights the central theme of the 2019 convention for the Society of Clinical Neuropsychology—future-oriented neuropsychology.

1. **Monitoring brain activity to develop digital biomarkers for neurodevelopmental disorders**

Mental and neurodevelopmental disorders account for nearly one-quarter of global disease morbidity, more than any other class of disorders. Evidence continues to mount that many symptoms that characterize mental disorders are the late manifestations of much earlier impairments in neural processing and neurodevelopment. This suggests that early detection of atypical brain development through routine monitoring may open a window for preventive psychological intervention that does not currently exist. Measurements of brain electrical activity with EEG may be under-utilized for clinical applications in neurodevelopment and psychiatry. A new generation of EEG devices has started to move into the commercial market in the past decade, making routine EEG measurements in primary practice a practical possibility. Autism spectrum disorder (ASD) is an example of a complex neurodevelopmental disorder that is believed to emerge at around 3 years of age following neural impairments in the first year of life. We collected EEG measurements from 99 infants with an older sibling diagnosed with ASD, and 89 low risk controls, beginning at 3 months of age and continuing until 36 months of age. Using advanced signal analysis and machine learning methods, prediction of the clinical diagnostic outcome of ASD or not ASD was highly accurate when using EEG-derived biomarkers from as early as 3 months of age. Specificity, sensitivity and PPV were high, exceeding 95% at some ages. Prediction of ADOS calibrated severity scores for all infants in the study using only EEG data taken as early as 3 months of age was strongly correlated with the actual measured scores. This suggests that useful digital biomarkers might be extracted from EEG measurements for monitoring cognitive and mental functions.

2. **Impact of rTMS on Cortisol Levels and Neuropsychological Functioning**

Although few studies have examined the impact of rTMS on cortisol or cognitive functioning to date, decrease in cortisol levels and increase in cognitive functioning has been demonstrated in clinical populations. In this present study, the impact of Repetitive Transcranial Magnetic Stimulation (rTMS) on overall neuropsychological functioning and salivary cortisol levels of patients was assessed to examine cortisol as a possible mediator for cognitive performance. Participants were ten adults, aged 20 to 67 years; all had been recommended for rTMS by healthcare professionals to treat various mental health conditions. Correlations were found between cortisol and delayed verbal recognition, free recall, and target discriminability; correlations were also found between cortisol and timed tasks of executive functioning, as well as cortisol and self-reported depressive and anxious symptoms. Although no significant decrease in cortisol was observed pre- and post-rTMS, performance on visual and verbal memory tasks improved significantly post-rTMS. A trend toward improvement was seen in self-reported depressive symptoms post-rTMS. These results suggest that further research regarding the role of rTMS and cortisol on cognitive functioning is warranted.

3. **Neurofeedback training and computational neuropsychiatry for serious mental illnesses**

We introduce the first study to develop and test focal neurofeedback cognitive training using principles and techniques of pupillometry. Processing speed training (PST) is a new cognitive training program that uses pupillometry to continually adjust training parameters for an optimal cognitive load and improve visual scanning efficiency by inhibiting selection of non-essential
targets and discriminating figure-ground details. Pupil dilation is a barometer of sympathetic nervous system load and reveals underlying neurophysiologic engagement that serves as a precursor to a decline in behavioral tasks. In this way, pupillometry provides a broad indication of how much an individual is actively involved in a training task at that very moment and allows us to optimize the training exercises by providing immediate biofeedback to the training software that then automatically adjusts training task parameters for a personalized and efficient training program. This is accomplished by incorporating a cutting-edge pupillometer device and novel real-time pupil analytics using computational modeling of pupil dilation and performance, multilevel modeling, and machine learning analysis. We tested PST in a putatively prodromal phase of psychosis to address processing speed (PS) deficits and social morbidity. Deficits in PS have found to be correlated with social aptitude in teenagers at clinical high risk for psychosis and variably identified as a risk marker for developing schizophrenia. Ninety-seven teenagers at risk for schizophrenia, age 12 to 19yo, were randomized to either PST for 2 months (2x/wk, 40 min each session) or an active control matched for training format and the same dose and duration of treatment. PST group showed faster motorical and non-motorical PS at post and 6 months. Subsequent results in social functioning at 6 month showed the PST group reporting better overall social adjustment. Targeting PS using pupillometric neurofeedback appears to be a promising pathway to improving co-morbidity and mitigating a risk factor for psychosis.

BASSO, M.R. (CHAIR), SUHR, J., RAPPORT, L.

**Publication Pitfalls -- Ethical Dilemmas in the Peer Review Process**

The APA Ethical Principles of Psychologists and Code of Conduct (2010) devotes a single section to research and publication activities. Most of this text concerns the humane and respectful treatment of research participants and laboratory animals. A visit to the APA Ethics Committee webpage yields no further guidance in this regard. In consulting publications and reports of the Research Ethics division of the APA Science Directorate, most of their documents concern ethical care and treatment of research animals. Information concerning authorship issues or the peer-review process is lacking.

Established by journal boards, the Committee on Publication Ethics (COPE) is a multidisciplinary resource on publication ethics that serves educative and consultative roles to editors, reviewers, and scientists. COPE has published several documents to help solve ethical dilemmas related to research publications, including a Code of Conduct and Best Practice Guidelines for Journal Editors.

COPE provides salient guidance regarding resolution of publication-related ethics issues. However, it is a relatively broad in its scope, and its specificity with respect to psychological science is relatively low. Few resources are available to psychologists concerning ethics of scientific publication. Thus, educating psychologists regarding such matters would fill an important void.

Towards this end, the symposium will feature associate editors of journals that cater to clinical neuropsychologists. They will discuss anonymized vignettes, delineate ethical issues involved, offer courses of action, and discuss the resolution. Notably, these vignettes were previously presented to illustrate dilemmas and key lessons. The current symposium will elaborate upon these points by permitting extended time for audience members to identify ethical issues, possible resolutions, and the anticipated costs and benefits of each solution, thereby enhancing learning outcomes. Furthermore, the authors will offer updated insights into the ethical
dilemmas and their resolutions. The authors will conclude by offering resource materials to facilitate compliance with ethical responsibilities in publishing.

(1) **Ownership and Authorship**

Vignette: A Reviewer writes to the Editor of the journal indicating that the manuscript under review was submitted by a student the Reviewer had mentored. The Reviewer had forbidden the student from publishing the research until a later time. The Reviewer also took issue with the fact that, not only was the Reviewer not listed as a primary author, but other individuals in the research lab were not listed as authors. When the concerns were communicated to the primary author, a series of written communications ensued, with vehement disagreements regarding the ownership of the data, the appropriate authorship of the manuscript, and whether it is appropriate to delay publication of the data.

**Questions to Discuss:** What is the ethically responsible thing to do for the editor? For the author? For the reviewer? What would have been the correct action?

**Discussion Points from existing Guidelines:** APA Publication Manual (6th ed.) 1.13. restates the Ethics Code guidelines (8.12 a and b) but elaborates on them in a helpful way. There is detailed discussion of what would constitute substantial professional contribution to a study in order to lead to authorship credit. This section also discusses acknowledgement of contributors for whom authorship does not seem appropriate, but who contributed to the project in some way. This section also does a nice job of preventive maintenance, pointing out that discussions of authorship should occur as early as possible in the project, and the need to re-assess this as a project continues. This section also discusses order of authorship based on contributions of those involved. Finally, there is discussion of what happens when the data arise from a dissertation.

(2) **Redos, Reuse, Recycle**

Vignette: An author submits a manuscript reporting a 12-item short form of the Confrontations Test, a widely used cognitive measure. Reviewer 1 alerts the Editor that papers reporting 15-item and 10-item short forms of the Confrontations Test have been published by this author over the past 2 years. With few exceptions, the sample appears similar for the three studies, and the results are nearly identical. Neither the cover letter nor the manuscript mentions that the data have been used for prior studies. The Editor contacts the Author for clarification about the manuscript in the context of the previous publications. The Author replies that her manuscript focuses on psychometric methods of constructing short forms; she is reusing the data for illustrative purposes.

**Questions to discuss:** What are the primary ethical concerns raised in the vignette for the author, editor, and reviewer?

**Discussion points from existing guidelines:** Duplicate, redundant, and piecemeal publication (Standard 8.13) are problematic because they represent findings from one database disproportionately in the literature. Guidelines regarding using data for multiple studies are not absolute, and some scenarios are common and acceptable. However, using previously published data without permission from the journals and comprehensive description of it in the manuscript would be double publishing.

The APA Publication Manual (1.09) provides definitions and guidelines for acknowledging prior work, including related citation(s). Additionally, authors should notify editors so that judgment can be made whether second (or third) studies can be published. Plagiarism, Self-Plagiarism, and copyright infringement also represent significant violations to address (Standard 8.11; Publication Manual 1.10). For the Editor, relevant COPE guidelines include encouraging reviewers to confront duplicate publication and plagiarism (4), violations regarding intellectual
property (13), and the obligation to act on possible misconduct (11). For the Reviewer and Editor, Standard 1 Resolving Ethical Issues is relevant.

(3) The Not So Blind Reviewer
Vignette: A Reviewer agrees to review a blinded manuscript. The Reviewer suspects that this paper is authored by a sometime collaborator. The sometime collaborator had offered primary authorship to the Reviewer several years ago for a study similar to that under review, but had never followed through on the offer. After completing the review, the Reviewer notifies the editor that he suspects the identity of the primary author, but does not think his review is biased. After tendering a highly critical review, the authors revise and resubmit. Upon reviewing the revision, the Reviewer, based on his previous conversations with the primary author, recognizes several irregularities. In particular, the Reviewer realizes that the primary author has misrepresented several aspects of the research in order to respond to criticism.

Questions to discuss: What are the primary ethical concerns raised in the vignette? What would be the ethically correct actions for the Reviewer, author, and editor to take?

Discussion points from existing guidelines: Blinded reviews are intended to minimize bias during the peer-review process. Unfortunately, authors may unwittingly suggest or reveal their identity. In doing so, unscrupulous reviewers may violate APA General Principles of Beneficence and No maleficence; Fidelity and Responsibility; and Integrity. Additionally, such actions would violate COPE Ethical Guidelines for Peer Reviewers, including, declare all potential conflicting interests; and ensure that reviews are based on the merits of the work and not influenced by personal considerations.

In addition to declaring potential conflicts of interest, reviewers are expected to notify the journal editorial staff of any perceived irregularities in the research under reviewer. If misconduct or dishonesty is detected, reviewers are obligated to notify the action editor. This expectation is derived from APA Ethical Standard1: Resolving Ethical Issues. It is also specifically articulated by the COPE Ethical Guidelines for Peer Reviewers.

Skill-Building Sessions

BLOCK, C. (CHAIR), AASE, D., GOODING, A.
Functional Neuroanatomy Primer – From Textbook to Case Conceptualization
This skill-building session is geared primarily to students and trainees, though attendees at all professional levels are welcomed. The overall aim is to provide attendees with working knowledge of the basic structural and functional neuroanatomy of the brain. First, basic brain organizational concepts will be reviewed (i.e., lateralization, lobar, cortical-subcortical). Then, important systems will be reviewed (i.e., larger-scale motor, somatosensory, limbic, default mode, salience, and central executive networks). The consequences of dysfunction to these areas will next be reviewed via case presentations to include a review of some of the major neurobehavioral syndromes and disorders. In this fashion, the neuroanatomical details will take on clinical relevance, and audience members will attain a deeper appreciation of how to integrate neuroanatomy into clinical case conceptualization, diagnostic decision making, and treatment planning.

DRISKELL, L.D. & SPERLING, S.A. (CO-CHAIRS), DEL BENE, V.A.
Clinical Case Presentations Hosted by the Association of Neuropsychology Students & Trainees (ANST)
While “Grand Rounds” at conferences are an educational experience to attend, trainees often find the idea of presenting at such an event to be intimidating given the wide range of training levels. In an attempt to provide a collaborative, trainee-oriented environment for clinical case presentations, the Association of Neuropsychology Students & Trainees (ANST) proposes to host an educational session consisting of the presentation of three clinical cases by trainees. The workshop will begin with a 15-minute presentation by the ANST Chair, Lucas Driskell, discussing case presentation skills and structure. Then, three trainees will each be provided 15 minutes for presentations, with an additional 10 minutes devoted to questions (total of 25 minutes per case). The discussion period will be facilitated by four co-chairs (current ANST chair Lucas Driskell, PsyD; Early Career Neuropsychologist Committee (ECNPC) Chair, Cady Block, PhD; Division 40 Education Advisory Committee (EAC) Chair Scott Sperling, PsyD, and the ANST Programming Officer Victor Del Bene, PhD). Individuals of all professional levels are encouraged to attend and participate in discussion.

This event will provide trainees the opportunity to gain experience presenting neuropsychology cases in a supportive environment, with constructive feedback from peers and career neuropsychologists. In turn, this opportunity would bolster student/trainee development in case conceptualization, professional presentation skills, and how to receive and facilitate feedback in the form of productive discussion.

This event will familiarize attendees with the Society for Clinical Neuropsychology (SCN). More specifically, ANST and the ECNPC sponsored by the SCN Education Advisory and Membership Committees. Lastly, this unique event will increase trainee submission and attendance at the 2019 annual APA convention.

Calls for submissions along with submission criteria will be sent out on SCN and ANST listservs. ANST officers, supervised by ECNPC and EAC members, will review all submissions and select three presenters.

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PUENTE, A.E. (CHAIR), PLISKIN, N., GILLASPY, S., PHELPS, R.

The 2019 CPT Testing Codes
1. Increase knowledge of the new 2019 testing codes
2. Understand the difference between base and add-on codes
3. Appreciate what clinical decision making and how to document

(1) The 2019 CPT Testing Codes
Codes for both neuropsychological and psychological testing were introduced in 2019. This is the largest paradigm shift on the conceptualization of testing since codes for such services were introduced several decades ago. There are several new aspects to the codes including: 1) base and add-on codes, 2) a new set of codes increasing from an average of two codes to approximately six per evaluation session, 3) a revised version of clinical decision making and cognitive (versus technical work), 4) a clearer demarcation between professional versus technical work avoiding historical double dipping, 5) suggestions for how to document both cognitive and technical work, and 6) a significant increase in the Relative Value Units associated with testing. The presentation will provide descriptions of each of the new codes, how to use them and several case illustrations that highlight the changes. Finally, we will present the emerging challenges associated with the introduction of the new codes in terms of carrier reimbursement, interpretation of units by third party reimbursers, and emerging practice patterns.

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Women in Psychology: Family Planning While in Training

Graduate school, internship, and postdoctoral fellowship are full time jobs that require a significant amount of energy and commitment. For many, these education and training experiences occur in a stage in life during which individuals desire to establish a family. Due to the high expectations placed upon trainees, some women in training experience stress, anxiety, and even cognitive dissonance when faced with the choice of starting a family while still in training. Some trainees feel alone and are unsure of how to broach various topics with their supervisors or mentors. Uncertainty also exists as to what topics are acceptable to discuss during practicum, internship, or fellowship interviews. This interactive workshop offers information, peer interaction, and mentorship to help women in training feel more prepared, supported, and knowledgeable about factors related to starting a family while in training. Following a brief presentation, attendees break into a series of small workgroups that are each led by women who are or have worked as training directors and/or supervisors that have experience with family planning, advocating for women’s’ rights, and mentorship related to professional development. Workgroups are structured to cover multiple issues related to being a woman in training who has or is considering starting a family, such as: 1) Making decisions on if and when to start a family, 2) balancing family responsibilities with efforts to achieve academic and career advances and success, 3) if, how, and when to discuss personal information with potential employers/supervisors/training directors on interviews, and 4) how to navigate the practical aspects of being a mother and student/trainee (e.g., daycare, pumping, shift in work responsibilities).

(1) Current Issues Facing Women Training in Psychology While Planning for a Family

Chair of APA Division35’s Motherhood Committee, Dr. Lauren Mizock, Chair of APA Division 40’s Association of Neuropsychology Students in Training (ANST) Dr. Lucas Driskell, and ANST Liaison Officer Dr. Emily Leaffer, will welcome attendees and present on the following topics: Purpose and goals of the present workshop, introduction of all participants, common issues experienced by women in training who have or are planning to start a family, and important legal rights allotted to trainees regarding familial responsibilities.

(2) Professional and Leadership Development as a Trainee and Parent

Drs. Kubu, Williamson, and Dale will draw from their expertise as practicum, intern, and postdoctoral supervisors, as well as mothers themselves, to offer practical advice balancing familial responsibilities while maintaining strong professional development and leadership skills. Between the three of them, they have been involved in institutional, regional, and national efforts related to women’s professional development and leadership in science and medicine. Of particular note, Dr. Williamson is a member of APA Division22’s Parenting Task Force on which she serves Division 22 families. As part of those efforts, these three have developed reputations as mentors for women and are frequently sought out to provide advice as to how one can effectively balance the multiple demands of being a woman while developing a successful
career - including when to start a family. They will field questions and provide professional advice based off of years of experience as supervisors, and mothers themselves.

(3) Navigating the Practical and Legal Aspects of Parenthood During Training and Employment

Drs. Kingsley, Mizock, Eichenbaum will draw from their expertise as practicum, intern, and postdoctoral supervisors, as well as mothers, to provide mentorship on questions regarding if, how, and when to discuss personal information with potential employers/supervisors/training directors on interviews. Of particular note, Dr. Mizock, Chair of APA Division 35’s Motherhood Committee, recently co-authored the “Parental Leave Resource & Climate Guide for Students and Psychologists,” a resource that helps students and psychologists understand their employment and legal rights regarding parenting. These three participants carry experience as consultants on topics of family planning with supervisees, as well as junior faculty and staff. They will provide mentorship to trainees on navigating the practical aspects of balancing family and work responsibilities, such as daycare, discussing and scheduling pumping, and making successful shifts in work responsibilities. This informal and interactive Q&A session will allow trainees a unique opportunity to ask candid questions and gain practical advice and feedback from leaders in the fields.

(4) The Importance of Building a Support System as a Trainee Planning for a Family

Dr. Leaffer, a postdoctoral fellow, Dr. Fang, an early career psychologist, and Ms. Cloutier, a predoctoral intern, will host a round table geared towards providing peer-support and mentorship. As mothers themselves in the late stages of training and the beginning of their careers, they will provide a safe space to discuss challenges they have faced and share how they overcame said challenges. Often, women in training that are planning for a family, pregnant, or recently became mothers, feel alone within their programs or work places. This table will provide the opportunity for attendees to build a network of supportive colleagues to reach out to after the convention comes to an end.

COLLABORATIVE PROGRAMS:

DEL BENE, V.A. & SPERLING, S. (CO-CHAIRS), EDGAR, V.B., NASH, L., NASH, J.  
How to Prepare for Specialty-Track Predoctoral Internships

The internship represents a final opportunity for doctoral-level psychology students to round out education and training through generalist experiences that represent critical competencies such as clinical interviewing, evidence based individual and group therapies, assessment, and oral/written communications. However, psychology has evolved to include a number of specialty areas that are of interest to trainees including neuropsychology, rehabilitation, behavioral health, and pediatrics, among others. For many, specialization begins during doctoral training, and is balanced against generalist training throughout the internship year. This collaborative workshop offers information, peer interaction, and mentorship to help trainees feel better prepared for selecting and pursuing specialty-track internships. Following a brief introductory presentation, attendees break into a series of rotating small workgroups that are each led by training directors and/or specialty-track supervisors in health service psychology. Workgroups are structured to cover specialty areas as well as cross-cutting issues such as consideration of training setting, CV preparation, and mock interviews.

(1) Special Considerations to Keep in Mind When Applying for Specialty-Focused Internship Tracks
As Programming Officer of APA Division 40's Association of Neuropsychology Students in Training (ANST), Dr. DelBene will welcome attendees and present on the following topics:

Looking for potential internship sites (when and where to look, considerations, how to assess fit), applications (preparation, review, submission), interview planning (receiving offers, scheduling, traveling healthy and cheaply), interview day (practical advice, dress/behavior, structure/content, follow-up), and matching (notification, what to do if you do not match, factors associated with matching).

(2) Interactive Small Group Session One: Neuropsychology in Academic Medical Center & CV Tips

Drs. Block, Boxley, and Sperling will draw from their expertise as neuropsychology trainee and early career neuropsychology leaders, to offer practical advice related to internship training with a specialty focus in neuropsychology. In particular, they will be able to discuss their experience with obtaining a job in a university medical center. They will also be providing guidance on how to develop a standout CV for internship applications and beyond. Advice related to CV content and structure will be given, and students are welcome to bring copies of their own CVs for individual feedback. They will be open to discussing their experiences with being a PhD vs. a PsyD in academia, as well as how to gain research experience on internship. This informal, interactive CV building workshop will allow students with interests in neuropsychology, rehabilitation, and pediatric neuropsychology to gain insight regarding how to make the most out of their training experiences and put their best foot forward during the internship application process.

(3) Interactive Small Group Session Three: Pediatric Neuropsychology – Internship and Interviewing Skill

Dr. Bordes Edgar will draw from her expertise as a neuropsychology postdoctoral, intern, and graduate student supervisor, and as a faculty member within a pediatric hospital to offer practical advice related to training guidelines for specialization in pediatric neuropsychology. She will also offer tips related to the interviewing process for predoctoral internships through the use of mock interview questions and answers. She will offer feedback and advice regarding the role of internship in career trajectory for individuals pursuing pediatric focused professional training, including discussion of postdoctoral training and early career considerations. This informal, interactive Q&A session will allow students a unique opportunity to ask candid questions and gain practical advice from an expert in their field of interest.

(4) Interactive Small Group Session Four: Rehabilitation & Neuropsychology – Overlapping Interests

Dr. Nash is the Director of Psychology of the Rehabilitation Psychology Department at the Shepherd Center. Dr. Kuemmel is the Program Director of the Rehabilitation Psychology Internship Track and Assistant Director of Psychology Training and Education at Louis Stokes Cleveland VA Medical Center. Dr. Pawlowski is the Post-Doctoral supervisor for the Polytrauma Transitional Rehabilitation Program at the Palo Alto VA. Together, Drs. Nash, Kuemmel, and Pawlowski will offer guidance about pursuing rehabilitation psychology track internships. Additionally, they will compare and contrast their expectations for internship vs. post-doctoral applicants, to help trainees plan and determine an ideal trajectory dependent upon their professional goals, and will speak to the overlap between neuropsychology and rehabilitation psychology tracks.

(5) Interactive Small Group Session Five: Health Psychology – Internship and Beyond
Dr. Nash is a professor and head of the Department of Allied Health Services at the University of Connecticut. Previously, he was the Director of Behavioral Health in the Department of Family Medicine at Brown University’s Alpert School of Medicine. Dr. Shook is the Chief of Pain Psychology at Geisinger Health System and previously was the program developer and team leader of the Primary Care Mental Health Integration Program and Liaison services at the Lebanon, Pennsylvania V.A. Medical Center. Dr. Esbitt is Senior Psychosocial Faculty at Montefiore Health System in the Department of Family Medicine. Previously, she completed her internship and fellowship at the Manhattan VA in primary care. Together, Drs. Nash, Shook, and Esbitt will offer guidance about pursuing health psychology track internships. Additionally, they will compare and contrast their expectations for internship vs. post-doctoral applicants, to help trainees plan and determine an ideal trajectory dependent upon their professional goals.

ZAHODNE, L. & ALOSCO, M. (CO-CHAIRS), MCCLINTOCK, S., BOOT, W., STERNS, A., BLOCK, C.
Modern-day Strategies to Support and Market Your Research Program: An Interactive Mentoring Workshop
Establishing a strong, sustainable research program is a primary goal for early career researchers. Funding and marketing are complementary keys to successfully transitioning to independence. The objectives of this interactive mentoring workshop are to provide attendees with knowledge and strategies to (1) pursue multiple avenues of funding; and (2) leverage social technology to brand expertise and promulgate research ideas. The first hour of the workshop will include interactive presentations on strategies to successfully secure federal, non-federal and industry funding, and to improve scientific communication and marketing in the 21st century. Dr. McClintock will provide an orientation to the federal grant system, with a focus on early-career opportunities through the National Institutes of Health. Dr. Boot will discuss alternative grant sources, including non-profit foundations, military organizations, and state agencies. Dr. Stern will describe industry and commercial partnerships, using two examples from his own research program. Finally, Dr. Block will provide an overview of the field of scientific communication and marketing, compare social platforms, and provide guidance on the use of social technologies to disseminate and promote science. This didactic program will be followed by round table discussions facilitated by approximately 10 successful investigators from multiple supporting divisions. These small-group discussions will be driven by table themes to provide attendees an individualized mentoring experience. Themes will be determined through consultation with early career representatives from supporting divisions and participating table mentors. Potential themes include: crafting a successful career development grant application, forming and nurturing multidisciplinary teams, linking research ideas to high-priority funding areas, leveraging Twitter and other social media platforms, and developing an effective lab website. By attending this workshop, attendees will gain advanced knowledge regarding funding opportunities; learn strategies for tailoring research proposals to different mechanisms; and develop skills to leverage social media to promote and brand a research program.

(1) Successfully Navigating the National Institutes of Health for Early Career and Research Support
The National Institutes of Health (NIH) is one of the largest supporters of early career scientific and research development, and offers internal and external substantive grant mechanisms, loan repayment program, inclusion and diversity support, and career development fellowship opportunities. Unfortunately, the NIH terrain can be difficult for early career psychologists to
navigate given that the NIH is comprised of approximately 30 institutes, offers various grant mechanisms each with unique rules and regulations, and has internal and external pathways for success. As such, early career psychologists are sometimes unable to fully benefit from the immense resources offered through the NIH. The purpose of this talk is to demystify the NIH and provide navigation strategies for research and career success. Specifically, this talk will provide 1) an overview of the NIH and associated internal and external career paths, 2) information about early career opportunities including fellowship (F-series) and career development (K-series) grant mechanisms, loan repayment program, and inclusion and diversity support, and 3) unique strategies to constructively problem-solve career path and research questions to achieve success.

(2) Alternative Paths to Funding your Research
In today’s competitive funding environment securing traditional federal funding (e.g., National Institutes of Health) for psychological research can be especially challenging, with the success rates of some NIH Institutes and Centers as low as 9% (M = 19.1%). This highlights the importance of casting a wide net when seeking research funding. This talk will focus on alternative funding opportunities to advance your research program. These alternatives include funding opportunities from military organizations, state agencies, private foundations, and sources that may be internal to your own university. I will discuss how these funding opportunities may differ from more traditional funding sources you may be familiar with, and will provide case studies of how each of these funding opportunities has funded psychological scientists to conduct their work.

(3) Succeeding in business and raising funding using the knowledge, skills, and abilities of psychology
Purpose: Entrepreneurship, including eHealth, provides an avenue for conducting and applying psychological research outside of more traditional academic and clinical settings. There are challenges to succeeding as an eHealth start-up. These include: the healthcare information system, the (lack of) understanding of health behavior change by healthcare professionals, and user-centered design. A review of these issues will be presented in the context of bringing to market 1) The Memory Magic program (http://www.memorymagic.com), a cognitive intervention therapy, and 2) iRxReminder (http://www.irxreminder.com), a smart phone-based platform for empowering patients and healthcare professionals to manage medications together. Method: Two gerontechnology products were demonstrated in randomized control trials. The Memory Magic program was compared to other activities and rated by staff. The iRxReminder app was compared to a booklet and a wired pillbox. Results: Memory Magic is now used in over 2200 facilities in 7 countries. iRxReminder is being used in 21 projects. Discussion: Both platforms act as cognitive prosthetics™ allowing independence to be extended. Success is built on deep knowledge of lifespan psychology and entrepreneurship to overcome barriers to change.

(4) Rise to prominence with social media: Using online platforms for research dissemination and national
Science communication involves the dissemination and diffusion of science-related topics to other professionals or the lay public. This can be accomplished in any number of ways, including but not limited to social media, auditory-visual media, print media, exhibitions, science cafes, and/or other outreach efforts. The purpose of science communication is multifold: it can inform the larger citizenship, help to shape policy and decision making, foster new or enhanced transdisciplinary collaborations, and in turn increase the visibility of the promoting scientist. Science communication is an emerging academic discipline, but may also be considered an
important area of competency in psychology as the field further evolves towards producing citizen-scientists. This lecture will provide a brief overview of the background and current state of science communication, review and weigh the advantages/drawbacks of currently available social platforms, and provide advice on how to leverage social media for disseminating and promoting one’s research and science identity. This will be followed by an interactive working group to prompt a more individualized discussion and exchange of ideas.

PAPER SESSIONS:

Paper Session I: Statistical and Brain Mapping Approaches for Detecting Neurocognitive Impairment

DE LA TORRE, G.G., DOVAL, S., GONZALEZ-TORRE, S.

Machine Learning Assisted Model for RBANS neurocognitive assessment process

In the context of Artificial Intelligence, supervised learning is a type of machine learning algorithm that uses a known dataset (called the training dataset) to make predictions. The training dataset includes input data and response values. The aim of this study was to elaborate a prototype design of supervised learning that could be used in order to develop an algorithm by dividing a data sample of Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) battery for the assessment of cognitive impairment into different groups according to the pathology of the patients and compared to a control group. This algorithm was trained and then it inferred functions that could be used for precisely mapping new samples and categorize them into groups, according to the performance in the different domains of the RBANS. For this machine learning, supervised learning model, 6 RBANS attributes were used: Immediate Memory; Visuospatial/Constructional; Language; Attention; Delayed Memory, and one more attribute class type for the diagnosis. Diagnosis was coded into 2 groups: Healthy (0) vs Pathology (1). The global score for each domain was used to analyze the probabilities depending of the total scores obtained with the aim of summarize the correction process and optimize the classification. Three different models of supervised learning were used in the study; first a linear discriminant analysis (LDA) to find the linear combinations to determine the different diagnosis groups. Second a decision tree model with the different RBANS indices so that the probability of belonging to each diagnosis category (clinical/ non clinical) can be observed in individual domains and finally a support vector machine model (SVM) to create a model that can predict in advance the diagnosis of any given trained data set.

PRICE, A.M., BUDSON, A.E., TURK, K.

Detecting Simulated Dementia: Comparing Behavioral Measures with Event-Related Potentials

The assessment of malingering and effort in dementia populations has produced variable results when using forced-choice recognition memory paradigms employed by many of the most popular symptom validity tests (SVTs). The purpose of the present study is to validate an attention-based measure for detecting malingered neurocognitive impairment in a geriatric population. The protocol compared mean reaction time (RT) and button press accuracy (BPA) to event-related potentials (ERP), while participants completed a continuous performance task. Forty participants, 20 Alzheimer’s disease (AD) patients and 20 healthy older controls were administered an auditory oddball go-no-go task while ERP signatures were collected. Healthy participants were instructed to either perform honestly or simulate dementia. Memory patients
were instructed to perform honestly. Performance on the Test of Memory Malingering (TOMM) was used as a control. Healthy older controls performing honestly, and simulating dementia, produced very similar P300 amplitudes (mean=6.91, SD=4.97; mean=6.54, SD=3.53, respectively), while AD patient P300 amplitudes were significantly lower (mean=3.62, SD=2.56). BPA on the go-no-go task was as hypothesized; healthy controls answering honestly performed well (mean=98.59, SD=2.44), AD patient performance was significantly reduced (mean=85.83, SD=14.08), and healthy controls simulating dementia performed at nearly chance level (mean=53.11, SD=15.57). Mean RT was also predictably skewed; healthy controls answering honestly produced significantly faster response times (mean=424.84, SD=91.92) compared to AD patients (mean=607.56, SD=125.15) and healthy controls simulating dementia (mean=568.63, SD=135.55). Overall, results suggest that ERP combined with behavioral measures may prove useful in detecting malingered cognitive impairment in a geriatric population.

HAN, D., LAMAR, M., FLEISCHMAN, D., KIM, N., BENNETT, D., ARFANAKIS, K., BARNES, L.L.
Perceived Discrimination in Older Black Adults is Associated with Insula Functional Connectivity

Background: Perceived discrimination is associated with a number of negative health outcomes. However, the neurobiological correlates of perceived discrimination remain unknown. Recent neuroimaging work has suggested the amygdala is sensitive to early life adversity and the insula is involved in assessments of trust in old age. We hypothesized that functional connectivity (FC) of these brain regions may be associated with perceived discrimination in older Black adults.

Methods: One-hundred and twenty-five non-demented older Black adults (mean age=74.90, mean education=15.39, 107 female) participating in the Minority Aging Research Study, the Clinical Core study, or the Memory and Aging Project of the Rush Alzheimer’s Disease Center completed a measure of perceived discrimination and a 3T MRI brain scan including structural T1 and resting-state fMRI EPIBOLD sequences. The right and left amygdala and insula were anatomically delineated as ROIs according to the Harvard-Oxford Brain Atlas and whole-brain voxelwise FC analyses were conducted using default parameters in the CONN toolbox.

Results: In regression analyses controlling for age, education, sex, and global cognition, perceived discrimination (mean value=1.34, s.d.=1.85, range 0 to 7), a composite score of nine items, was associated with (1) greater FC between the left insula and the bilateral intracalcarine cortex, (2) less FC between the left insula and the left dorsolateral prefrontal cortex, and (3) less FC between the right insula and the left supplementary motor area (voxel threshold p-value<0.005, cluster threshold FDR-corrected for multiple comparisons at p<0.05). Amygdala analyses yielded no significant findings.

Conclusions: Greater perceived discrimination is associated with differential insula functional connectivity in older adults. More specifically, results suggest that the experience of discrimination may result in distinct brain changes that increase or decrease connectivity to a key region (the insula) involved in trust perception. More research is needed to determine the longitudinal aspect of this association.

KNEAVEL, M.E., ERNST, W., MCCARTHY, K.
Evaluation of the Effectiveness of a Novel Peer Concussion Education Program for College Athletes
A multi-site randomized controlled trial was conducted to evaluate the effectiveness of a novel peer concussion education program across 10 NCAA Colleges and Universities in the United States. The peer concussion education program employs two teammates from each team who serve as peer educators for their teammates. The model is both a peer-mediated and cognitive-behavioral model of educating student-athletes about sports-related concussions. The peer educators deliver two modules: Reinforcing and Enhancing Concussion Knowledge as well as Enhancing Concussion Reporting. The program is built on three important components: interdisciplinary, peer-mediated, and cognitive-behavioral. First, this model is interdisciplinary as it requires the expertise and commitment from multiple professionals in multiple fields at the institution. Additionally, this program encompasses a peer-mediated model as its implementation utilizes peer-educators. Finally, this program includes a cognitive-behavioral model of change as the peer-educators assist teammates in understanding concussion symptoms, return to play protocols, and cognitions that impede or facilitate concussion-reporting. 1468 male and female student-athletes from 60 teams (30 experimental, 30 control) representing all 3 NCAA Divisions completed the study. Sports represented included men’s soccer, wrestling, lacrosse, ice hockey, basketball and baseball and women’s field hockey, soccer, ice hockey, basketball, softball, and lacrosse. Evaluation of effectiveness included knowledge of concussion symptoms and the return to play protocol. Additionally, assessment of changes in cognitions around reporting both oneself and a teammate was based on Ajzen’s theory of planned behavior and utilized measures of direct attitudes, direct subjective norms, direct perceived behavioral control, indirect attitudes, and indirect perceived behavioral control. Measures were assessed at baseline, post-intervention, and at a one-month follow-up. Results indicated that student athletes who participated in the Peer Concussion Education Program demonstrated greater increases in concussion knowledge, intention to report concussions, understanding of the return to play protocol, direct subjective norms (believe other important people feel it is important to report), direct perceived behavioral control (perceived ability to report concussions), and indirect attitudes (beliefs about concussion reporting) compared to controls. These changes held at the one-month follow-up.

**Paper Session II: At the Crossroads of Psychiatric and Cognitive Alterations**

**KARR, J.E., IVERSON, G.L., KOTILAINEN, A.K., LUOTO, T.M.**

**Age, Psychiatric Diagnosis, and Outcome at One Week Following Mild Traumatic Brain Injury**

Background: Pre-existing psychiatric conditions have been associated with worse outcomes following Mild Traumatic Brain Injury (MTBI). However, little is known about the association between pre-injury mental health problems and outcome from MTBI in older adults.

Method: Participants included 276 adult patients aged 18-96 (M=60.51, SD=22.16; 48.9% men) who presented with a suspected MTBI (GCS=13-15) to the Emergency Department at Tampere Hospital in Finland. Participants were grouped based on age (≤49 years-old; n=88; 50-74 years old; n=95; ≥75 years-old; n=93) and history of a psychiatric condition in their medical records (ICD-10-CM F20-F69). Participants were excluded if they underwent surgery or died within a week of injury. A research nurse evaluated outcome at one-week using the Rivermead Post-concussion Symptoms Questionnaire (RPSQ), the Glasgow Outcome Scale-Extended (GOSE), and the Modified Rankin Scale (MRS). Dependent variables included the RPSQ Total Symptom Score, GOS-E Total Score, and difference score between the post-injury MRS and the...
retrospectively rated pre-injury MRS (i.e., ΔMRS). A 2x3 ANCOVA was conducted for each outcome, controlling for gender and diagnoses of dementia, neurological disorders, and circulatory diseases.

Results: There was no significant difference in the prevalence of pre-injury psychiatric disorders across age groups [\( \chi^2(2)=2.44, p=.295 \)]. The most common psychiatric conditions across groups were mood disorders (≤49=25.0%; 50-74=26.3%; ≥75=17.2%) and neurotic, stress-related, and somatoform disorders (≤49=9.1%; 50-74=9.5%; ≥75=3.2%). All other conditions occurred at rates under 5% across groups. A significant interaction was observed between age and psychiatric diagnosis for the RPSQ [F(2, 209)=9.08, p<.001, \( \eta^2=.08 \)], but not the GOS-E (p=.137) or the ΔMRS (p=.728). There was a main effect observed for age for the RPSQ [F(2, 209)=6.00, p=.003, \( \eta^2=.05 \)] and the GOS-E [F(2, 264)=5.71, p=.004, \( \eta^2=.04 \)]. Follow-up pairwise comparisons indicated higher RPSQ scores for participants under 50 (p=.008-.010) compared to both older age groups, and worse GOS-E for participants 75 and older compared to both younger age groups (p=.005-.016). Follow-up ANCOVAs for separate age groups indicated that RPSQ [F(1, 80)=13.55, p=.001, \( \eta^2=.15 \)] and GOS-E [F(1, 83)=8.56, p=.004, \( \eta^2=.09 \)] scores differed based on history of a psychiatric condition, but only for participants under 50 years old. Because outcomes were non-normally distributed, all analyses were also conducted using non-parametric tests, without controlling for covariates. The results of non-parametric analyses did not differ, and parametric findings are reported above.

Discussion: The current study suggests that, among participants with a history of psychiatric conditions, younger adults tended to report more post-concussion symptoms and present with greater functional impairment than older adults at one-week following MTBI. These results indicate that the relationship between pre-existing psychiatric conditions and outcome from MTBI may be moderated by age. The reasons for worse outcomes among younger adults with psychiatric conditions are likely multifactorial and could be related, in part, to a higher prevalence of life stressors among this age group (e.g., work-related stress, parenting). Future research should examine the specific psychiatric conditions associated with worse outcome following MTBI.

Impact of Cannabis and Alcohol Use Disorders on clinical and cognitive outcomes in Bipolar Disorder
Introduction: Cannabis and Alcohol Use Disorders are common in individuals with Bipolar Disorder (BD), though few studies have examined if the clinical and neurocognitive outcomes in these often comorbid conditions are different than those without the comorbid condition. Thus, the current study aimed to elucidate clinical factors and cognitive performance of bipolar patients with or without a history of Cannabis Use (CUD) and Alcohol Use (AUD) Disorders.
Method: Participants were selected from the Prechter Longitudinal Study of Bipolar Disorder. Of the participants recruited for the longitudinal cohort, 527 individuals with confirmed Bipolar Disorder and 285 Controls without any history of any prior psychiatric illness were included in the present study. Of those with BD, 344 individuals had no history of any Substance Use Disorders (SUD), while 139 individuals had a lifetime history of only Alcohol Use Disorders and 44 individuals had a history of only Cannabis Use Disorders. Participants completed neuropsychological testing and clinical and symptom severity scales. Eight factor scores (capturing executive functioning, attention, memory, fine motor function, emotion processing)
previously derived from a confirmatory factor analysis of neuropsychological tests were utilized. Demographic differences were addressed specifically in analyses in order to eliminate potential confounds.

Results: When comparing BD groups to Controls, the BD with CUD group exhibited significantly poorer performance than BD without SUD (p=.02) and Controls (p=.005) in auditory memory. The BD without SUD and BD with AUD groups exhibited significantly poorer performance than Controls in verbal fluency and processing speed (p<.001 and p=.046, respectively). All three of the BD groups exhibited poorer performance than Controls in processing speed with interference resolution (ps<.03). The BD without SUD and BD with CUD groups exhibited significantly poorer performance than Controls in inhibitory control (p<.001 and p=.041, respectively). Correlation analyses revealed a significant inverse correlation between length of CUD and all cognitive factors. A significant inverse correlation was also found between length of AUD and psychomotor speed and dexterity, visual memory, auditory memory, emotion processing, verbal fluency and processing speed, and processing speed with interference resolution. For clinical features, the BD with CUD had a significantly greater number of psychiatric hospitalizations as compared to the other BD groups. Furthermore, BD with CUD reported experiencing significantly more bodily pain compared to Controls (p=.01), whereas all three BD groups reported worse role limitations due to emotional problems and worse social functioning compared to Controls (ps<.009).

Conclusions: Bipolar patients with a history of comorbid CUD showed significant dysfunction for auditory memory above and beyond the dysfunction observed in BD without SUD. BD with CUD also reported worse clinical outcomes with more psychiatric hospitalizations. Future research might address longitudinal outcome as a function of BD, CUD/AUD, and BD with these comorbid conditions to evaluate the underlying neural and functional consequences of these illnesses.


Statement of the Problem: Anorexia nervosa (AN) is a medically serious eating disorder characterized by extreme dietary restriction, objectively low weight, a relentless drive for thinness, and body image disturbance. Although the etiology of AN is poorly understood, alterations in reward processing and increased punishment sensitivity and harm avoidance are reported in AN, suggesting that differential learning following reward or punishment may contribute to the development and maintenance of symptoms, including food avoidance. We tested the differential sensitivity of AN women to reinforcing versus aversive outcomes using a probabilistic associative learning task (PALT). Current reinforcement theory maintains that learning on such tasks is determined by reward prediction errors (RPE), signaling the difference between actual and anticipated outcomes. Moreover, dopaminergic neurons encode prediction errors and dopamine depletion alters reward and aversion processing in mice, supporting the potential use of the PALT as a behavioral probe to investigate dopaminergic function in anorexia nervosa.

Participants: Individuals with a current DSM-5 diagnosis of AN (n=41; 38 female) and age-matched healthy controls (HC; n=37; 36 female).

Methods: Participants performed 2 sets of a two-choice PALT. They received 25 points when choosing the optimal response on reward trials, but lost 25 points when choosing the non-optimal response on punishment trials. Response selection can reflect several unobserved psychological
processes and is, therefore, not a valid reflection of any specific psychological function. We used a parametric, computational model to investigate three unobserved processes underlying performance on the PALT. The model parameters were: (1) learning-rate following a positive RPE, (2) learning-rate following a negative RPE, and (3) a value representing the balance between exploring new stimulus-response associations versus exploiting the associations learned. Bayesian methods were used to estimate the three model parameters. Note that positive and negative RPE do not directly mirror outcomes on reward and punishment trials. For example, negative prediction errors occur whenever participants anticipate a positive outcome but either receive no gain on reward trials or a loss on punishment trials.

Results: A group by set ANOVA revealed a significant shift towards exploiting learned stimulus-response associations on Set 2 compared with Set 1, \( p = .001 \), \( \eta^2 = .154 \), with no significant effect of group (\( \eta^2 = .037 \)) nor a group by set interaction (\( \eta^2 = .016 \)). A second ANOVA found that AN participants had greater learning-rates following negative RPE than following positive RPE, whereas HC did not (interaction: \( p = .007 \), \( \eta^2 = .097 \)). Moreover, the mean of the two learning parameters was smaller in Set 2, \( p = .025 \), \( \eta^2 = .069 \), and larger in the AN group \( p = .029 \), \( \eta^2 = .065 \), due to their increased negative RPE learning-rate.

Conclusions: On Set 2, participants shifted towards exploiting the stimulus-response associations they learned on Set 1, increasing their sensitivity to smaller learning rates. Unlike HC, AN participants were more sensitive to negative prediction errors than positive prediction errors. Greater sensitivity to negative outcomes relative to expectation may fuel the harm avoidance tendency of individuals with anorexia nervosa.

HOFFMEISTER, J., MULLIGAN, R., BASSO, M., WHITESIDE, D., COMBS, D.
Scales of Anxiety and Depression better at Detecting Depression than Anxiety in Multiple Sclerosis
Lifetime prevalence of anxiety and depression among people with multiple sclerosis (PwMS) is higher than that of the general population. Diagnosis of depression or anxiety among PwMS confers greater risk of increased morbidity, disability, and decreased quality of life. Thus, accurate detection of the presence of comorbid anxiety or depression is essential in administration of effective treatments to improve quality of life among PwMS. The present study evaluated the differential classification accuracy of three different measures of anxiety or depression: the Mood and Anxiety Symptom Questionnaire (MASQ), a theory-driven measure of anxiety and depression; the Mental Health Inventory (MHI), a readily accessible measure of anxiety and depression; the Chicago Multiscale Depression Inventory (CMDI), a well-established measure of depression among PwMS.

Participants were 96 PwMS, who were primarily female (\( n = 75 \), 78.1%), and Caucasian (\( n = 87 \), 90.6%). Their average age in years was 45.37 (SD = 10.63). Participants were interviewed using the Mini Neuropsychiatric Interview 6.0, a semi-structured diagnostic interview based on DSM-IV criteria, to determine current diagnosis of depression and anxiety-related disorders. Sixteen participants (16.7%) met criteria for current major depressive disorder. Likewise, 16 participants (16.7%) met criteria for any current anxiety related disorder (generalized anxiety disorder \( n = 10 \), agoraphobia \( n = 7 \), panic disorder \( n = 4 \), social phobia \( n = 2 \)). Participants were then administered the MASQ, MHI, and CMDI.

Receiver operating characteristic (ROC) curves were used to assess the diagnostic accuracy of the MASQ, MHI, and CMDI subscales for depression and anxiety-related disorders in PwMS. With regards to detecting current diagnosis of depression, all subscales of each measure
demonstrated significant areas under the curve (AUCs; ps ranging from <.001 to .017). The strongest AUCs were demonstrated by the mood subscale of the CMDI, the general depressive distress subscale of the MASQ, and the behavioral control and depression subscales of the MHI (AUCs = .90). Sensitivities for these measure ranged from .81 to .82 and specificities ranged from .78 to .83. With regards to detecting current diagnosis of anxiety, all subscales of the MHI and only the positive affect subscale of the CMDI demonstrated significant AUCs (ps ranging from .004 to .01). However, no AUCs exceeded .79. The general anxiety distress and anxious arousal subscales of the MASQ achieved non-significant AUCs (ps = .24 and .07, respectively). Overall, most depression and anxiety measures demonstrated high classification accuracy for current diagnosis of depression, but not anxiety. Additionally, measures of diminished positive affect, typically a symptom specific to depression, demonstrated notable classification accuracy for current diagnosis of anxiety. Previous research has suggested that anxiety is a potent predictor of the development of depression among PwMS. The current study augment these findings and further suggest a transdiagnostic approach in treating disorders of emotional distress among PwMS. Additionally, the current study highlights the need for more effective measures to detect current diagnosis of anxiety among PwMS.

CONVERSATION HOURS:

DUNN, C. & BLOCK, C.K. (CO-CHAIRS), AASE, D., SPERLING, S.
ECNPC Representative Network – Creating Connections
The Early Career Neuropsychologist Committee within the Society for Clinical Neuropsychology (division 40) has recently launched a network of state-specific early career representatives who are given the opportunity to serve as a mentor to other early career neuropsychologists within their state. Having the input of these representatives will be vital to the growth and development of this network. This conversation hour is designed to facilitate interaction and discussion between representatives to create cohesion and allow for the exchange of ideas about the growth of the network and how to have success as a mentor.

1) Creating Connections: Perspectives from Illinois
Dr. Darrin Aase is the Illinois Early Career Representative for ECNPC and has been involved in Division 40 as an APA Program Committee member as well as the Practice Advisory Committee member for the past few years. He completed his doctorate degree at DePaul University (Chicago, IL) and completed his fellowship in clinical neuropsychology at Loyola University Medical Center (Maywood, IL). Dr. Aase is a tenured professor at Governors State University (University Park, IL) within the Department of Addictions Studies, and also holds appointments at the Jesse Brown VA Medical Center (Chicago, IL) and the University of Illinois Chicago (Chicago, IL), where he contributes to both clinical neuropsychology training programs and is a Co-Investigator on multiple VA-funded research projects. He is also in the late stages of the ABCN boarding process. Dr. Aase has enjoyed serving in various clinical and non-clinical roles as a neuropsychologist, and looks forward to understanding and advancing early career neuropsychologist needs through the ECNPC network.

2) Creating Connections: Perspectives from Virginia
Dr. Scott Sperling earned his doctorate degree from the Wright Institute in Berkeley, CA and completed his predoctoral internship at the Jesse Brown VA Medical Center in Chicago, IL. He completed his postdoctoral fellowship in Clinical Neuropsychology in the Department of Neurology at the University of Virginia, where he remains on faculty as Assistant Professor of
Clinical Neurology and Associate Director of Postdoctoral Training in Clinical Neuropsychology. Dr. Sperling’s clinical work focuses primarily on the assessment of older adults and neurodegenerative diseases. He conducts funded clinical research evaluating the neurobiological and clinical predictors of neuropsychiatric symptoms and cognitive decline in Parkinson’s disease, post-operative non-motor outcomes following functional neurosurgery, and the efficacy of multi-component intervention programs aimed at reducing caregiver burden and improving dementia care. He currently serves as Chair of APA’s Society for Clinical Neuropsychology’s Education Advisory Committee, Early Career Neuropsychology State Representative for Virginia, and Practice Representative for APA’s Committee on Early Career Psychologists.

POSTERS:

**Poster Session I**

**BRAGG, K.M., MARCHAND, G.C.**

**Mentoring in neuropsychology: methods and outcomes from a longitudinal assessment**

Receiving formal mentorship in the early stages of a research scientist’s career is widely acknowledged for its value in promoting quality scholarship, increased productivity, and career advancement (Chew et al., 2003; Johnson et al., 2010). However, research dedicated to measurement of mentoring value, specifically in fields such as neuropsychology, is early in its development (Hilsabeck, 2017). Weaknesses in the current mentoring literature include: lack of attention given to institutional factors contributing to the mentoring relationship, few studies measuring longitudinal mentoring outcomes, and no national level consensus for criteria used to evaluate mentoring relationships (Allen et al., 2017; Manson, 2016; Meagher et al., 2011).

The present study seeks to address each of these gaps in the literature by strategically evaluating formal mentoring relationships established for mid-career level, NIH-funded neuropsychology researchers. This study reports on the methods used to longitudinally track mentoring relationships, characteristics of successful mentoring relationships, and mentorship outcomes. Mentoring relationships were assessed for five research faculty who have received between 1-4 years of formal mentoring as part of their involvement in a NIH-funded center for neurodegeneration and translational neuroscience. Two measurement tools were developed to gather qualitative and quantitative data from mentors (n=7) and mentees (n=5). Measurement tools were designed to capture data relevant to the success of the mentoring relationship as noted in the literature (Berk et al., 2005). Qualitative baseline interviews were followed by annual assessment via online surveys. Although similar in context, separate interview protocol and survey versions were given to each participant based on their role in the mentoring relationship.

Findings suggest that research faculty may benefit from multiple mentoring relationships that meet distinct needs, e.g. technical skills, research design, grant writing, and navigating institutional factors. Mentees benefitted from receiving mentorship from mentors across institutions and were able to develop functional, productive relationships regardless of geographical proximity. Mentorship pairs who established clear goals and maintained consistent communication patterns reported higher levels of satisfaction and collaborative productivity over time. Further, the use of formative evaluation, through which mentees and mentors were provided timely feedback about the development of their relationships, was a successful method implemented to improve the structure and nature of the mentoring relationships over time.
Overall, this study provides valuable insight into unique aspects of mentoring relationship development to compare experiences for research faculty mentees housed at different research institutions, but who collaborate in research for one translational neuroscience research center. Methods and findings from this study can be used to inform future research on mentoring in neuropsychology and mentoring relationship development.

PIAZZA-RODRÍGUEZ, A.A., HARLEY, D., RIVERA, J., ROSE, S., CREEKPAUM, M., GONZÁLEZ, J., FRANK, M., GOMEZ, R.

Exercise predicts memory performance over time among older Latinx adults

Statement of the Problem: There is a direct relationship between aging and hippocampus deterioration, with memory worsening over time. (Erickson et al., 2009). Exercise has been found to improve cognition and increase neuroplasticity while also decreasing the risk of neurodegenerative disorders (Cotman & Berchtold, 2002; Forbes et al., 2015). According to the Alzheimer’s Association (2017), Hispanics/Latinxs have a higher prevalence of memory decline as compared to other ethnicities. However, few studies have investigated the relationship between exercise and memory performance among older Latinxs over time. Therefore, the purpose of this study is to evaluate whether physical exercise, at baseline, predicts memory performance over seven years among older Latinx adults.

Subjects Used: Archival data was collected from 1998-2007 from the Sacramento Area Latino Study on Aging (SALSA) (Haan et al., 2017). The sample consisted of 1,789 participants (745 males and 1044 females), 754 English and 1035 Spanish speakers. A total of 809 reported being born in Mexico, 871 born in the United States, and 99 reported other. Age mean was 70.65 years and the average education was 7.23 year.

Procedures: Memory performance was measured by the Spanish English Verbal Learning Test (SEVLT), which is validated in both Spanish and English. Exercise was measured by a qualitative physical activity questionnaire. Type of exercise was categorized as active (e.g., dancing, work out) and inactive (e.g., cooking, sitting).

Results: Using Mixed Modeling analyses, hours of exercise were found to significantly predict performance on the SEVLT test at seven different time points, with active exercise showing a stronger relationship (F=62.66; p < .001) than inactive exercise (F=7.398; p = .007). Years of education (F=749.04; p<.001) and age (F=650.41; p<.001) also predicted performance on the SEVLT.

Regression models were also conducted on all seven-time points, with active exercise being a better predictor of memory performance (Beta=.081; p<.001) than inactive exercise (Beta=.075; p<.001). Active exercise significantly predicted memory performance on the SEVLT year one (Beta=.171; p<.001), year two (Beta=.093; p<.001), year three (Beta=.091; p<.001), year four (Beta=.059; p=.014), and at year five (Beta=.061; p=.012). However, it was not a significant predictor at year six (Beta=.032; p=.184), and year seven (Beta=.014; p=.563).

Inactive exercise had significance at year one (Beta=.116; p<.001), year two (Beta=.096; p<.001), year three (Beta=.062; p=.011), year four (Beta=.062; p=.010), year six (Beta=.062; p=.010), and year seven (Beta=.071; p=.003). However, it was not a significant predictor at year five (Beta=.042; p=.083).

Conclusions: Active exercise was found to be a better predictor of memory performance than inactive exercise among older Latinx adults. Active exercise was less significant on year six (2004-2006) and seven (2006-2007) which could implicate significant attrition rates due to
worsening of physical and mental health. This study suggests that active exercise may help maintain better memory functioning for at least five years.


Cognitive Training Increases MCI-to-Normal Reversion Rate in the ACTIVE Study
Statement of the problem: Early identification of those at risk for dementia is important given the expectation that early intervention offers a chance to delay or reduce the likelihood of future progression. Mild cognitive impairment (MCI) is thought to represent a transitional state between normal cognition and dementia; however, a large proportion of individuals, particularly in community- or population-based studies (up to 30-50%) revert to normal cognitive status when re-evaluated at later occasions. Little is known about how cognitive training interventions in older adults with MCI impact reversion rates.

Participants used: Participants (N=2794, mean age=73.6, SD=5.9, mean education=13.5, SD=2.7, 76% female, 26% African American) from the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study were classified as cognitively normal or MCI at baseline (BL) and immediately post-training (PT; i.e., within 2 weeks of intervention completion) assessments. ACTIVE participants were randomized to one of four cognitive intervention groups: memory, reasoning, or attention/speed training, or a no contact control group. Each intervention was ten 60-75 minute sessions occurring over 5-6 weeks. Procedure: MCI classifications at BL and PT were determined using criteria proposed by Jak, Bondi and colleagues (Jak et al., 2009; Bondi et al., 2014). First, a “robust” control group (i.e., 216 untrained control group participants who maintained an MMSE score >26 for the duration of their study participation) was identified. Second, in this group, each cognitive test score (2 scores from each domain: memory, reasoning, speed/attention) was regressed on age, education, sex, and race at each occasion. The resulting regression weights were used to produce expected scores for each participant had they remained cognitively robust and had been untrained. Third, participants whose actual scores were >1 SD below the demographically adjusted expected scores on two tests within a single cognitive domain or one test across each of three domains assessed were classified as MCI.

Results: The estimated BL prevalence of MCI within the sample was 29.2% (roughly evenly divided between amnestic and non-amnestic). There were no differences in BL MCI prevalence by training group (χ²=0.85, df=3, p=.838). Of those participants classified as MCI at BL and PT (n=717), a higher proportion of those who received one of the three cognitive training interventions appeared to revert to cognitively normal status at PT relative to the no-contact control group (44.3% vs. 35.0%, χ²=4.66, df=1, p=.031). The proportion of those who appeared to revert did not differ by specific cognitive intervention (memory: 42.9% vs. reasoning: 42.7% vs. speed: 47.2%, all ps>.05).

Conclusions: These findings suggest that older adults who have objective cognitive impairment have higher reversion rates to cognitively normal status after a brief cognitive training intervention than those older adults without training. It will be important to examine reversion rates over time to determine whether these effects are maintained or are primarily due to the immediate training experience. Future work will also determine whether rates of progression from MCI-to-dementia are slowed by cognitive training.
IMRE, Z., CASHER, G.A., KIBBY, M.Y.
Associations between perseveration and behavioral functioning for children with and without ADHD

Background: Individuals with Attention-Deficit/Hyperactivity Disorder (ADHD) often experience executive dysfunction (Barkley, 1994); this is particularly true for inhibition and working memory (Muir-Broaddaus et al., 2002; Shuai et al., 2011; Toplak et al., 2009). In contrast, there are more mixed findings on shift. Some studies have found that children with ADHD perseverate on tasks more than controls (Romine et al., 2004; Reeve & Schandler, 2001), whereas others have found the contrary (Weyandt et al., 1998; Fischer et al., 2005). Furthermore, perseveration may be related to several behavioral problems (Fischer et al., 2005; Séguin et al., 2002). Hence, the current study examined relationships between shift and various behavioral factors in children with and without ADHD.

Methods: This experiment utilized data from a larger, grant-funded study (R03 HD048752, R15 HD065627). Data were collected on a community sample at a Midwestern university. All participants’ parents received a free, comprehensive neuropsychological evaluation for their participation, and participants received a T-shirt. Data were gathered on 283 children (55% male) with a mean age of 9.57 years. Participants presented with ADHD (n = 88), Reading Disorder (n = 51), comorbid ADHD and Reading Disorder (n = 51), controls (n = 74), or other DSM-5 disorders (n = 19). As part of the larger study, the Wisconsin Card Sorting Task was administered to the participants (WCST, Heaton et al., 1993), with the Behavior Assessment Scale for Children, Second Edition (BASC-2, Reynolds et al., 2004) and the Behavior Rating Inventory of Executive Functions (BRIEF; Gioia, 2000) being completed by their parents. From the BRIEF, the Inhibit and Shift subscales were used. From the BASC-2, Aggression and Conduct Problems subscales were used.

Results: Multiple regression analyses were conducted to examine how well ADHD diagnostic status, Perseveration Errors from the WCST, and the interaction between the two predicted the 4 subscales from the BRIEF and BASC noted above. Results of the regression analysis indicated that ADHD diagnostic status was predictive of the four BASC and BRIEF subscales used (p’s < .001). In contrast, WCST Perseveration Errors was not predictive of any BASC or BRIEF subscale (p’s > .05). Nevertheless, the WCSTxADHD interaction significantly predicted most subscales: inhibition (β = .20, p = .01), aggression (β = .26, p = .002) and conduct problems (β = .23, p = .01). More specifically, having moderate or worse perseverative errors was associated with conduct problems and poor inhibition in children with ADHD but not controls. This relationship was most pronounced with aggression.

Conclusions: Findings suggest WCST Perseveration Errors alone are not predictive of poor behavioral regulation in children without ADHD. However, for children with ADHD, the tendency to perseverate is related to worse inhibition, aggression, and conduct problems. This interaction may explain the variable findings on shift in the literature, especially when the total sample is used. Also worthy of note, WCST performance did not predict Shift on the BRIEF. This may be due to setting effects (lab versus daily life) and/or that they are measuring different aspects of shift.

FERNANDES, M.A., SIEGLE, G.J., TONE, E.B.
Pupillary and Eye-Tracking Patterns to Emotional Faces Among Individuals with Social Anxiety
Well-established cognitive models of social anxiety (SA; Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997; Heimberg et al., 2010) suggest that socially anxious people negatively interpret neutral stimuli, catastrophize about the consequences of negative social cues, and preferentially recall negative information. Further, biased attention for threat is commonly, but variably, linked to SA; whereas some socially anxious individuals attend preferentially to threat cues (Mogg, Philippot, Bradley, 2004), others tend to avoid them (Price, Tone, & Anderson, 2011; Waters, Mogg, & Bradley, 2012). Heightened physiological reactivity in response to threat may, at least in part, co-occur with these maladaptive biases (Barlow, 2002; Reiss, 1991). Recent work suggests that a tendency to avoid looking at arousing cues may constitute a strategy for managing over-arousal associated with those cues. We thus examined whether patterns of attention to threat in SA vary as a function of individual differences in physiological reactivity, such that those prone to high arousal display higher avoidance of threatening cues. We predicted that larger pupil diameter while viewing threat cues would be associated with diminished gaze time at threat cues among those experiencing greater SA.

In the present study, participants completed a two-part face feedback task while eye movements and pupillary dilation were monitored. Pupil dilation, a reliable and parsimonious measure of emotional and cognitive load (Bradley, Miccoli, Escrig, & Lang, 2008), has begun to receive attention as a non-invasive, temporally-sensitive way to measure physiological reactivity among healthy (Bijleveld, Custers, & Aarts, 2009) and clinical populations (Silk et al., 2007; Siegle et al., 2003; Siegle, Steinhauser, & Thase, 2004). In part one of the task, college students (n = 51) completed a reaction time task and rated their own performance on a 0-100 scale after every 5 trials. In part two of the task, participants rated their reaction time performance during presentation of faces morphed in intensity (50% happy – 50% angry) that provided feedback about their performance on the previous 5 trials. Pupillary dilation and eye tracking data collected during the task reveal that levels of SA interact with pupil diameter in response to angry faces of low ($\beta = -.304, p < .05$) and high ($\beta = -.308, p < .05$) intensity to predict time spent viewing those faces. Specifically, in both conditions, for individuals who endorsed heightened SA, pupil diameter was negatively associated with eye gaze duration. In contrast, for those who endorsed lower levels of SA, pupil diameter was positively associated with eye gaze duration. Results suggest that for those higher in SA, visual avoidance of threat cues may serve as an emotion regulation strategy.

KADEY, K.R., WOODARD, J.L.
Relationship Between BMI and Cognitive Change in Older Adults Using the Wisconsin Longitudinal Study
Cognitive decline is pervasive in late life, but body mass index (BMI) represents a modifiable lifestyle factor that could play a role in influencing the risk of cognitive decline in older adults. Previous research is in disagreement as to whether low BMI (<18.5) or high BMI (>25) present the greatest risk for cognitive decline, with most research suggesting that elevated BMI raises the greatest risk of cognitive decline and of developing Alzheimer’s disease or other dementias (Cournot et al., 2006; Gustafson, Rothenberg, & Blennow, 2003; Loef & Walach, 2013; Xu et al., 2011). The present study examines baseline BMI in mid-life and late-life and change in BMI as a predictor of cognitive decline.
Participants were obtained from the Wisconsin Longitudinal Study (WLS), a publicly available longitudinal study following a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957 for over 60 years. For the present analyses, data was obtained
from timepoints 1993, 2003, and 2011. Linear regressions were performed to examine whether BMI in mid-life and in late-life predict later cognitive performance. From 1993-2003, participants experienced a 1.15-point increase in BMI, while from 2003-2011, participants increased BMI by .87 units. Simple linear regressions revealed no significant relationships between changes in BMI during mid-life and future cognitive performance in late life, but an increase in BMI from 2003 to 2011 predicted poorer performance on all cognitive measures in 2011. The effect of baseline BMI on cognitive change was also examined using simple linear regressions. Elevated BMI in mid-life predicted declines in performance on an immediate recall task but increases in performance on a letter fluency task from 1993 to 2003. Likewise, late-life elevations in BMI significantly predicted declines in performance on digits ordering, immediate recall, and delayed recall tasks from 2003 to 2011. Increased BMI in late-life is a stronger predictor of cognitive decline than increased BMI in mid-life. Elevated BMI in late-life predicted poorer performance only on future measures that primarily assess memory functioning. Future research should control for other factors that may influence the relationship between BMI and cognitive function, such as level of physical activity, muscle mass, or presence of comorbid diseases. Although BMI is a relatively coarse index of physical health, elevated levels may be associated with neuroinflammation in late-life, thereby creating conditions favorable to cognitive decline.

RAJAGOPAL, S., EKSTROM, L., SANCHEZ VARELA, V. Correctional Inpatient Norms for the RBANS
Background: It is estimated that up to 20 percent of state and federal prisoners suffer some form of cognitive disability compared to five percent in the community (Kimbell, 2016). Psychiatrically hospitalized inmates in particular present with a high degree of neuropsychological impairment, influenced by a variety of biological, sociocultural, criminogenic, and environmental factors (Young & Justice, 1998). The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) is a commonly used screening battery that presents many advantages for use in a correctional inpatient setting, including relatively short administration time and the ability to screen for impairment across multiple domains of neuropsychological functioning. While past research has established RBANS normative data for community inpatient populations (Iverson, et al., 2009) and specific psychopathology such as schizophrenia (Gold et al., 1999; Hobart et al., 1999; Wilk et al., 2004), normative data for correctional inpatient populations is lacking.
Objective: The primary purpose of this presentation is to provide preliminary normative data for the RBANS index and individual subtests for a correctional inpatient population. A comparison with existing data on a community inpatient psychiatric sample will also be explored.
Method: Participants for this study are adult, mentally ill, English-speaking, incarcerated males currently housed within the Psychiatric Inpatient Program at the California Medical Facility. Participants are recruited through a routine clinical referral process as well as by random selection. Data have also been collected from existing databases containing previously tested patients admitted to the Department of State Hospitals-Vacaville from January 2007 to January 2017. Data will be collected on 100 participants who have been administered the RBANS. Results will include demographic, psychiatric, and criminogenic descriptive data in addition to data on RBANS Index and individual subtest scores. Clinical implications and future research directions will also be discussed.
A Short Form of the Verbal Concept Attainment Test in Multiple Sclerosis

Objective: As many as 70% of people with multiple sclerosis (MS) have cognitive impairment, and many exhibit executive dysfunction. Most executive function measures in MS have focused upon non-verbal measures. The Verbal Concept Attainment Test (VCAT) has demonstrated validity as an executive function measure in people with MS, but its length (23 items and 30 minute administration time) may decrease its utility. The current study evaluated reliability and validity of a short-form of the VCAT.

Participants and Methods: A neuropsychological battery was administered to 44 healthy individuals and 94 people with MS. Based on existing norms, they were classified as impaired or unimpaired, resulting in 63 people with MS categorized as unimpaired and 31 as impaired. Inspection of VCAT scores revealed minimal variation on the first nine items, indicating that they failed to discriminate between impaired and unimpaired individuals. Scores on the remaining 14 items were summed and examined.

Results: The VCAT short form achieved significant correlations with measures of executive function, working memory, and verbal memory (p’s < .001). Regarding classification validity, the VCAT alternate form achieved satisfactory sensitivity (.72) and specificity (.73) in identifying neuropsychological impairment in people with MS. The VCAT short form achieved significant correlations with measures of functional outcomes and disability status (p’s < .003). It achieved acceptable split-half reliability (r = .81). Conclusions: The short form of the VCAT appears to possess satisfactory reliability and criterion, classification, and ecological validity. These data offer promise of a verbally mediated measure of executive function in people with MS.

Comparing Processing Speed and Memory Predicting Activities of Daily Living in Older Adults

Statement of the Problem: With age, certain skills, such as a processing speed and memory, decrease in strength (Balota, Dolan, & Duchek, 2000). This is also true for everyday activities of daily living (Dunlop, Hughes, & Manheim, 1997). Getting dressed, bathing, and eating, would be considered activities of daily living (ADLs). Shopping for groceries, making calls, and managing money are considered instrumental activities of daily living (IADLs). However, no studies to the authors’ knowledge investigated processing speed and memory abilities of older adults so as to predict performance of ADLs and IADLs. Therefore, this study examined whether processing speed and memory performance can better predict ADL and IADL performance.

Subjects Used: Data was collected from the Aging, Demographics, and Memory study. There is a total of 748 participants. The mean age is 81.59, with the range being 70-110 years old. 49% of the participants are female. 79% percent are Caucasian. 17% of participants are Black or African American. 3% of participants are Hispanic. The mean amount of education is 10.28 years, with the range being 0-17.

Procedures: Each participant’s ability to perform a certain ADL was determined by questionnaire, filled out by a trusted informant. The informant answers yes or no to the subject’s ability to perform a task. The measures include the Trails Making A task and Symbol Digit Modality for processing speed and the Wechsler Memory Scale Logical Memory subtest (WMS – LM), the Benton Visual Retention Test, and the CERAD Verbal Learning and Memory: Word List Learning test measure memory.
Results: Linear regressions were used to analyze the predictive relationship between the Trails Making A task, Symbol Digit Modality, the WMS – LM, the Benton Visual Retention Test, and the CERAD Verbal Learning and Memory: Word List Learning test and the total score and average score of the ADLs, IADLs, and both combined. For combined ADL and IADL functioning, all of the tests significantly predicted 30.4% of the variance (Symbol Digit Modality test: Beta = .103, p = .007; Trails Making A: Beta = -.429, p < .001; Benton Visual Retention test: Beta = -.092, p = .028; WMS – LM: Beta = .161, p < .001; Word List Recognition: Beta = .144, p < .001). For ADL functioning only, all of the tests significantly predicted 19.1% of the variance (Symbol Digit Modality test: Beta = .123, p = .003; Trails Making A: Beta = -.384, p < .001; Benton Visual Retention test: Beta = -.153, p = .001; WMS – LM: Beta = .091, p = .032; Word List Recognition: Beta = .105, p = .03). For IADL functioning only, all of the tests, except for the Benton Visual Retention test significantly predicted 32.9% of the variance (Symbol Digit Modality test: Beta = .105, p = .005; Trails Making A: Beta = -.411, p < .001; WMS – LM: Beta = .200, p < .001; Word List Recognition: Beta = .148, p < .001).

Conclusions: The findings suggest that processing speed and memory can both predict IADL and ADL performance. This could indicate that both processing speed and memory are much needed and trusted factors when performing these tasks, when compared to memory. More research must be done to look at what could possibly influence processing speed and memory ability and, in turn, influence IADL and ADL performance.

MCARDLE, M.L., INDOREWALLA, K., PIRYATINSKY, I. Case Report on Moyamoya Disease

Background: Moyamoya disease (MMD) is a rare, chronic cardiovascular condition characterized by stenosis and gradual occlusion of internal carotid arteries coming together at the circle of Willis. Initially thought to be most prevalent in Asian countries, especially Japan, a growing body of research has identified the cases of MMD across the globe, resulting in increased awareness in western countries. While research on this disease has largely examined the medical implications of the disease, its neurocognitive and neuropsychiatric impact on the individual is less appreciated. Here, we present the findings from a comprehensive neuropsychological evaluation conducted on an individual diagnosed with MMD. This patient’s present is complicated by cerebral vascular accidents (CVAs) as well as bilateral craniotomy, which will be described below.

Method: Ms. Doe, a 34-year-old, right-handed, Caucasian woman, with 19 years of formal education, presented with cognitive complaints with regard to a new onset of difficulty with word-finding, concentration, memory, planning, and slowed speed of processing of new information. The patient was referred for neuropsychological evaluation to determine the cognitive effects of the disorder on the patient, in particular, the nature of cognitive impairment in MMD superimposed by ischemic stroke and several craniotomies to provide maximal revascularization.

Results: In the context of high average estimated premorbid overall capacity, Ms. Doe’s neurocognitive profile was notable for impairments in simple auditory attention, processing speed (with and without motor component) working memory, encoding as well as new verbal learning, verbal fluency, and speeded fine-motor dexterity (with dominant, right hand slower than the left). It is important to note that the patient’s performance was found to be significantly
worse on verbally mediated tasks. There is evidence to suggest a lateralized profile, which will be discussed in detail.

Conclusions and Future Direction: MMD affects the cognition and daily function in affected patients, to a greater extent those who suffer additional vascular incidents and undergo multiple craniotomies. There is a clear growth of research on MMD, however, limited information is available that describes neurocognitive and neuropsychiatric outcomes. Neuropsychological profile was consistent with impairments in language, processing speed, executive functioning and upper motor dexterity, with lateralized findings. Memory was relatively spared. The data is closely examined to provide a unique example of the lateralized neuropsychological profile and deficit pattern in a historically high functioning individual diagnosed with MMD following a stroke.

HARDT, B.M., NGUYEN, A.T., GATTO, N.M., LEE, G.J.
Working Memory as a Mediator of the Relationship Between Education and Phonemic Fluency

Background: Many studies have demonstrated the relationship between education and phonemic fluency, such that higher years of education is associated with better performance on tasks of phonemic fluency; however, the mechanisms underlying this relationship remain unknown. Phonemic fluency has been empirically linked to language production and executive control. Researchers have also found positive associations between education and measures of processing speed and working memory; however, there is great heterogeneity in the literature on the protective role that education plays on working memory performance and other cognitive domains when considered as a proxy of cognitive reserve. As single cognitive measures may not fully capture true cognitive function, a composition of multiple tests may result in more accurate and reliable representations of cognitive functioning. Thus, we examined whether composite scores of processing speed and working memory mediate the relationship between education and phonemic fluency.

Participants and Methods: Adults aged 65 and older (n=130; 56.4% Female; 43.6% Male) were recruited from the Loma Linda University Adventist Health Study-2. Participants completed a two-hour neurocognitive battery, which included an assessment of age, education, FAS, WAIS-IV Digit Span (DS), Trail Making Test (TMT), Cogstate Brief Battery, and WAIS-IV Coding. Multiple measures of both working memory and processing speed were used to create composite standard scores, which may strengthen the effect of the mediators. A multiple mediation analysis using Bootstrapping was performed to examine if working memory composite scores (DS, Cogstate Two-back task) and processing speed composite scores (Coding, TMT-Part A, Cogstate Detection reaction time) mediated the relationship between education and phonemic fluency (FAS).

Results: Results indicated that education significantly predicted phonemic fluency scores, such that as education increased by one-year, phonemic fluency performance increased by .09 standard deviations, after controlling for age and mediators, b = .09, p < .01. The multiple mediation analysis partially supported our hypothesis. Working memory significantly mediated the relationship between education and phonemic fluency; as education increased by one-year, phonemic fluency scores increased by .03 standard deviations through the indirect effect of working memory (DS Total, Cogstate Two-Back), a2b2 = .03, 95% BC CI [.01, .06], p < .05. Processing speed did not significantly mediate the relationship, p > .05.
Conclusion: Several studies of normal aging have elucidated the role of education in age-related cognitive decline, reporting slower cognitive and functional decline in older adults with higher educational level. One etiological hypothesis is that higher levels of education increases brain reserve by enhancing cortical synapse density, which in turn may buffer age-related cognitive decline. The present study demonstrated that greater years of education is associated with increased working memory performance, which then increased phonemic fluency performance. The relationship between education and phonemic fluency performance was not influenced by processing speed performance, perhaps due to the fact that processing speed is a leading indicator of age-related changes in other cognitive domains, but not verbal ability. Future research should consider the effect of working memory on the relationship between education and performance on language tasks in detection of cognitive impairment.

DOSHI, S., FREER, B., TIERSKY, L.
Response Inhibition in Adults with Depression and Attention Deficit Hyperactivity Disorder
Objective: Adults diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) have well-documented deficits in executive functioning (Boonstra, Oosterlaan, Sergeant, & Buitelaar, 2005). Pennington & Ozonoff (1996) identified five domains of executive function including planning, working memory, fluency, cognitive flexibility and inhibition and concluded that ADHD is associated with deficits in inhibition. In fact, response inhibition has been repeatedly identified as a core deficit in ADHD (Oosterlaan, Logan, & Sergeant, 1998). Response inhibition is considered a measure of cognitive control (Pan et al., 2011) and impaired cognitive control has also been reported in individuals diagnosed with depression (Snyder, 2013). Prior studies have found a high rate of comorbidity between ADHD and depression (Erdogan & Delibas 2018). However, little research has explored the additive effect of comorbid ADHD and depression on executive functioning, specifically response inhibition. In the current study it was hypothesized that adults with comorbid depression would have more difficulty with response inhibition than adults with depression alone or ADHD alone.

Methods: This study included 62 adults who visited a community-based clinic for a psychological assessment. Participants completed a battery of neuropsychological assessments including the Conner’s Continuous Performance Test 3rd Edition (CPT-3). Commission errors on the CPT-3 were regarded as a measure of response inhibition. Three groups were created based on diagnoses provided by doctoral students under the supervision of licensed clinical psychologist following a neuropsychological evaluation: those with ADHD only (n= 25), those with depression only (n= 22), and those with both ADHD and depression (n= 15).

Results: An ANOVA was conducted to test the differences between the three groups. The analyses revealed that those with comorbid depression and ADHD (M=19.47, SD=5.22) had significantly more inhibition errors than individuals with ADHD alone (M=16.40, SD=9.38, p <.05) and individuals with depression only (M=11.14, SD=7.53, p <.001). Additionally, in our sample, the ADHD group’s performance did not significantly differ from that of the depression only group (p=.109).

Discussion: Our findings support the initial hypothesis and demonstrate that having both ADHD and depression amplifies the deficits in response inhibition. Response inhibition is the ability to inhibit reactions to competing events. Clinicians should be aware of the compounded effect of depression and ADHD on inhibitory processes because inhibitory failures can have negative consequences in everyday life. Successful response inhibition has important implications in goal-
directed behavior and decision making and treatment focusing on improving self-control and inhibition may have a positive impact on functioning in individuals who have been diagnosed with ADHD and depression.

**HORTON, A.M., REYNOLDS, C.R.**

**Toward a short form test of executive functioning: Intelligence**

Statement of Problem: This poster assesses the relationship between a short-form of the Test of Verbal Conceptualization and Fluency (TVCF) a test of executive functioning, and intelligence test scores from the Reynolds Intelligence Assessment Scale, Second Edition (RIAS-2). Earlier research found some TVCF scores were correlated with intelligence test scores. This poster examines if subtests of the short form of executive functioning are also correlated with intelligence test scores.

Subjects Used: 29 adult clinical patients referred by neurologists and psychiatrists for outpatient neuropsychological evaluations at a private practice office were used as subjects. The patients included 14 females, 26 Caucasians and 2 African-Americans. 27 patients were right-handed. Diagnoses include Stroke-15, Traumatic Brain Injury-7, Alzheimer’s disease-3, Multiple Sclerosis-2, Parkinson’s disease-1 and Brain Tumor-1. Ages ranged from 20-74 (Mean-52.9, Standard Deviation-14.4) and education ranged from 10-20 years (Mean-15.8, Standard Deviation-7.7).

Procedure: All of the adult patients were administered full neuropsychological batteries that included the TVCF. All subjects had signed informed consent documents and passed performance validity testing. The short-form of executive functioning utilizes a card sorting format to assess executive functioning and the proposed short-form which uses half of the number of cards (58) used with the TVCF long-form (116) and may be a more time efficient means of assessing executive functioning. The subject learns to sort a deck of cards by the principles of color, topic (animals, transportation, food and clothing) and number of words on a card in response to verbal feedback. Scores included Number Correct (NC), Perseveration Errors (PE) and Number of Categories (CN). The RIAS-2 is a new measure of intelligence organized into an overall Composite Intelligence Index (CIX) composed of the Verbal Intelligence Index (NIX) and Nonverbal Intelligence Index (NIX). The VIX and NIX each have two subtests to assess abstract thinking and long-term memory. Verbal Reasoning (VRZ) and Guess What (GWH) for VIX and Odd-Item Out (OIO) and What’s Missing (WHM) for the NIX. Correlations were calculated between the three short form of executive functioning subtests and the seven RIAS-2 indices and subtests.

Results: The PE scores were not associated with any measure of intelligence. The NC scores were statistically significantly correlated with CIX, VIX and GWH scores at the P<.01 level and with NIX, OIO and VRZ scores at the P<.05 level. The CN scores were statistically significantly correlated with the CIX, NIX, and OIO scores at the P<.05 level. Conclusions: The PE scores appear to be measuring something different than intelligence. As OIO and VRZ are measures of nonverbal and verbal abstract thinking the significant correlation with both with the NC scores and OIO with the CN scores helps validate the NC and CN scores as a measures of executive functioning. These results suggested a more time efficient short form of executive functioning may be feasible. Further research on the use of the short form of executive functioning to assess executive functioning appears warranted.
ROCHETTE, A.D., STELMOKAS, J., CIGOLLE, C., HOGIKYAN, R., PHILLIPS, K., KHAN, F., HA, J., ALEXANDER, N.

The association between cognitive screening measures and number of falls in post-acute care

Objective: Falls comprise the majority of safety incidents reported in the hospital setting and are associated with extended length of hospital stay, increased morbidity and mortality, and higher healthcare costs. Importantly, experiencing a fall can increase risk for subsequent falls and research suggests that those with one vs. multiple falls have different fall risk profiles. Falls are particularly frequent among older adults in the post-acute care (PAC) setting. Thus, identifying factors upon PAC admission that distinguish single and repeat fallers might be useful to help decrease the repeat falls. Our recent preliminary data suggested that repeat fallers were more likely to fall earlier in their PAC stay, but there were no other apparent baseline risk factors differentiating single from repeat fallers. Cognitive impairment, previously associated with increased multiple fall risk, was not evaluated. Accordingly, we sought to determine whether cognitive screening measures, such as the Montreal Cognitive Assessment (MoCA) or the Independent Living Scales Health and Safety subscale (ILS-HS), might differentiate these two groups. We hypothesized that individuals with lower scores on cognitive screening measures would be more likely to fall multiple times during their PAC stay.

Participants and Methods: Retrospective medical record review was completed for 114 Veterans who experienced a fall while admitted to a Veterans Administration Hospital Community Living Center post-acute care unit (CLC-PAC). Individuals who completed cognitive screening during their admission process and had available MoCA and ILS-HS total scores were compared between single (N=39) and multiple (N=19) fallers. Fifty-six individuals were excluded from the current study due to missing cognitive data; these individuals did not differ from those included in the study in terms of demographics (p>0.05) and had a similar ratio of single and repeat fallers (p>0.05). The final sample was comprised of 58 primarily older (70.67±10.40 years, range=54-94) male (98%) Veterans. Missing data were excluded case-wise.

Results: Mann-Whitney U tests revealed no difference in MoCA scores for single (n=25, M MoCA score=18.86) vs. repeat fallers (n=14, M MoCA score=17.79), U=161.50, p=0.69. Similarly, there was no difference in ILS-HS raw scores for single (n=31, M ILS-HS score=28.00) vs. repeat fallers (n=10, M ILS-HS score=27.80), U=135.50, p=0.55. Impaired scores on the ILS-HS (<1SD and <2SD) and the MoCA (<21) did not differentiate single and repeat fallers (all p>0.05). Exploratory follow-up analyses suggest possible unique patterns between ILS-HS scores and time to first fall (e.g., for falls occurring >20 days postadmission, fallers tend to have unimpaired ILS-HS scores, though those with low ILS-HS scores tend to fall earlier).

Conclusion: In this preliminary study, neither MoCA nor ILS-HS scores differentiated individuals who fell once vs. multiple times during their CLC-PAC stay. Further work is needed to determine the importance of cognition in predicting multiple fallers and time to first fall, and whether other factors, such as nursing or physician interventions performed based on recognition of baseline cognitive impairment, ameliorated the increased multiple fall risk.

GORMLEY, J., EILENBERGER, D.

A Meta-Analysis: Predictive Value of REM Sleep Behavior Disorder in Diagnosis of Lewy Body Dementia
Dementia with Lewy Bodies (DLB) is a progressive and degenerative disease marked by atypical deviations in the synaptic protein known as a-synuclein, affecting both the peripheral and central nervous systems. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), DLB affects 0.1% - 5.0% of the elderly population and constitutes 1.7% - 30.5% of all dementia diagnoses. In 2010, the U.S Census found that 1.3 million people were diagnosed with DLB and anticipate that the rates of diagnosis will double by 2050. Despite its high prevalence, little is known about the prodromal stages of DLB, making it difficult to diagnose. Increasing clinician knowledge of prodromal stages and predictors would enhance competence in early diagnosis. Current research highlights an association between REM sleep behavior disorder (RBD) and DLB. Therefore, a meta-analysis was conducted on current literature to identify the predictive value of RBD in DLB diagnosis, as RBD is not currently specified as a core or suggested diagnostic feature in the DSM-5. Findings suggest that 1) individuals diagnosed with DLB experience more complex and recurrent sleep disturbances, with RBD occurring 2.6 times more frequently, when compared to individuals diagnosed with other forms of dementia; 2) RBD precedes the development of memory impairments in DLB, such that the longer the individual experiences RBD, the greater the likelihood of developing DLB; 3) the combination of RBD and cognitive impairments further predict the development of DLB, specifically when deficits in attention and executive functioning are present. In sum, the literature gives evidence to the association between RBD and DLB and suggests that RBD may hold clinical utility in the early detection and diagnosis of DLB, given the prodromal nature of RBD.

WENKE, B., ERNST, W., KNEAVEL, M.E., MCCARTHY, K.
Impact of Previous Concussion and Peer Concussion Education on Knowledge and Reporting
This study investigated the effect of a novel peer-mediated concussion education program on knowledge of concussion symptoms and attitudes around reporting behaviors among a sample of NCAA Division II student-athletes. A total of 50 student-athletes (n=34 men’s Lacrosse and n=16 from Women’s Soccer) participated in a peer concussion education program in which 2 peer educators from each team provided peer education to their individual teams. The peer concussion education program employs both a peer-mediated and cognitive-behavioral approach to educating student-athletes about sports-related concussions. Specifically, the program consists of two modules: Reinforcing and Enhancing Concussion Knowledge as well as Enhancing Concussion Reporting. In allowing the student-athletes a chance to participate in these processes, this model works to change the culture of concussion reporting from within the team itself, rather than from an external entity. The study evaluated the influence of previous concussion on total symptom knowledge, intention to report a concussion in oneself, and intention to report a concussion in a teammate before and after implementation of the peer concussion education program. Results of a mixed design ANOVA in which previous concussion served as a between subjects variable and differences from baseline to post-test served as the repeated measures variable indicated that symptom knowledge, intention to report oneself and one’s teammate all significantly changed from baseline to post-intervention. In addition, having had a previous concussion significantly influenced overall intention to report a teammate. These findings provide preliminary support for the effectiveness of the program with respect to its two key objectives: enhancing concussion knowledge and increasing intention to report concussion. The implications of these findings with respect to concussion education will be discussed.
VEERAMUTHU, V.
Advancing Clinical Neuropsychology in Developing Nations: The Malaysian Journey and Ethical Dilemmas
Clinical neuropsychology as a whole is still in its nascency in Malaysia and Asia. This presentation will review the historical development of neuropsychology as a clinical subspecialty in Malaysia, the formation of the professional society for clinical neuropsychology, the recommended training pathways, life as a clinician in Malaysia, the standard and newer techniques in neuropsychological assessments and clinical investigations, functional brain mapping and advanced intraoperative techniques. Additionally, some cutting edge translational clinical researches conducted locally and published in high impact peer-reviewed journals will be reviewed briefly along with the ethical dilemma faced by Malaysian healthcare practitioners in providing specialised - neuropsychological care.

O’DESCY, I.
Is Turner's Syndrome Actually Turner's Syndrome?
Turner's syndrome (TS) is a disorder wherein women are born with a genotype that is distinctly different from the genotype typically seen in women. The typical genotype for individuals with Turner syndrome is 45X, indicating that they have one X chromosome and they are missing a second sex chromosome in the 23rd pair of chromosomes. For some individuals, the blank is missing and in other individuals, the second chromosome presents as a small O ring on the karyotype but individuals with either genotype are diagnosed with Turner's syndrome. Research has demonstrated that the severity of physical symptoms shown by individuals with Turner's syndrome is specifically related to the percentage of cells that are affected. More specifically, individuals with a mosaic pattern show fewer medical complications than individuals with an isochromatic pattern. Additionally, previous research has also shown that the cognitive pattern of individuals with either genotype display the same cognitive pattern with regard to severity of the learning issues with which they present. Previous research presenting the cognitive patterns of an individual with an isochromatic form of TS and an individual with a mosaic form of TS (24%) showed that both presented with the same Nonverbal Learning Disability and their cognitive profiles were not significantly different. However, there is another genotype that is referred to as Turner syndrome wherein the affected individual actually has 2X chromosomes but the short arm of one X chromosome is replaced with a long arm of another X-chromosome. While women with this genotype are diagnosed as having Turner syndrome, this paper suggests that this may not be an accurate diagnosis for these individuals because their cognitive pattern is not consistent with the typical pattern seen in individuals who been diagnosed with Turner's syndrome. This paper suggests that this particular genotype actually reflects a disorder that is separate and distinct from Turner's syndrome.

Cultural and Linguistic Competency Training from a Socially Responsible Neuropsychology Model
Objective: The Cultural Neuropsychology Program (CNP) within the UCLA Hispanic Neuropsychiatric Center of Excellence (HNCE) is the sole bilingual clinical training program specifically focused on culturally and linguistically competent neuropsychological services to the
Latino/a population in the UCLA Health System. Following the Socially Responsible Neuropsychology Model (SRN; Suarez et al., 2016), trainees learn best practices in providing equitable clinical care to all patients regardless of their background. The current paper discusses various trainees’ professional development process in becoming culturally and linguistically competent bilingual (Spanish-English) clinical neuropsychologists. Method: The use of case studies illustrates the competency paradigm shift trainees encounter when systematically integrating the SRN model with their clinical training. Three components of the model are emphasized: (1) integration of Etic and Emic approaches during the clinical intake, (2) merging psychometric properties with qualitative processes to compensate for the cultural-linguistic limitations of mainstream gold-standard neuropsychological tools, and (3) becoming an advocate through this social justice framework. Outcomes: All trainees were previously exposed to the foundational and typically required knowledge-based competency of understanding and appreciating cultural individual differences and diversity in neuropsychology. Attaining cultural and linguistic competency through the SRN model, however, requires a salient paradigm shift in all skill-based competencies trainees may not have been prepared for by their previous education. Discussion: By presenting trainees’ perspectives regarding their professional development, the importance of systematically integrating the fundamentals of brain-behavior relationships explicitly with the SRN model early in graduate and post-graduate training is highlighted. In so doing, this approach can ultimately augment the number of culturally- and linguistically-competent neuropsychologists needed to reduce health disparities.

PÉREZ, S., MARQUES, J.G., HINOJOSA-MENA, J.
Neuropsychological development in Syndromic Craniosynostosis

Background: Syndromic Craniosynostosis is a group of more than 160 syndromes characterized by premature closure of the sutures of the skull. They are genetic and chronic health conditions and are accompanied by other craniofacial malformations, hands and feet as well as functional alterations such as hearing, eye problems, neuropsychological alterations and mental health that cause learning difficulties, emotional and behavioral problems among others. Most of the literature tells us about IQ, currently, authors tend to pay attention to the cognitive profile of affected people.

Method: We studied a sample composed of 150 people affected by syndromic craniosynostosis (Apert, Crouzon, Pfeiffer and Muenke syndrome) in an age range of 0 to 50. The cases were evaluated with psychometric tests adapted to their normative group. Cognitive diversity and the gender perspective were taken into account, and we analyzed and described the neuropsychological characteristics.

Results: Our results show the description of the cognitive processes (memory, attention, language, visuospatial, executive function and praxis) affected and preserved in the neuropsychological development, as well as the correlation between these.

Conclusion: Given that these are low-frequency diseases, through descriptive-correlational studies such as the one we present, we conclude the opportunity shown by the analysis and description of the cognitive processes in this pathology as a way to learn more about the impact of the disease and its functional consequences that have an impact on the appropriate clinical neuropsychological intervention.
ERNST, W., KNEAVEL, M.E., MCCARTHY, K.S.
A Qualitative Thematic Analysis of a Concussion Reporting Activity with Collegiate Student-Athletes
Estimates indicate that between 1.6 and 3.1 million concussions occur because of sports and recreation related injuries per year (Langlois, Rutland-Brown, Wald, 2006). Moreover, a substantial percentage of student-athletes continue to play while symptomatic (Kroshus, Garnett, Hawrilenko, Baugh, & Calzo, 2015; Torres et al., 2013). A novel peer concussion education program was developed which employs both peer-mediated and cognitive-behavioral approaches to educate student-athletes about sports-related concussions with the aim of increasing concussion reporting. The peer-educators assist teammates in understanding concussion symptoms, return to play protocols, and cognitions that impede or facilitate concussion-reporting through the delivery of two modules: Reinforcing and Enhancing Concussion Knowledge as well as Enhancing Concussion Reporting. The concussion knowledge module focuses on the pathophysiology of concussion, symptom identification, possible consequences of playing with a concussion and the return to play protocol. The concussion reporting module consists of a structured worksheet activity where the peer-educators assist their teammates in identifying thoughts that impede concussion reporting and replace them with thoughts that might facilitate reporting. A multi-site randomized controlled trial was conducted to evaluate the effectiveness of the novel peer education program across 10 NCAA Colleges and Universities in the United States. 1468 male and female student-athletes from 60 teams (30 experimental, 30 control) representing all 3 NCAA Divisions completed the study. Men’s sports included football, men’s soccer, wrestling, lacrosse, ice hockey, basketball and baseball. Women’s sports included field hockey, soccer, ice hockey, basketball, softball, and lacrosse. This presentation will review the qualitative, thematic analysis of 503 worksheets completed during the concussion reporting module. The peer educator led worksheet activity consisted of two components which involved listing thoughts that impede concussion reporting and then listing replacement thoughts that might facilitate reporting. Analysis of thoughts that impede reporting yielded 11 themes including concerns about losing playing time, letting down the team, losing one’s spot on the team, ending a career, having a negative impact on fitness and skill level, game and situational factors, negative reactions from teammates, negative reactions from coaches, uncertainty about symptoms or presence of concussions, adverse impact on academic functioning, and missing out on social activities. Analysis of replacement thoughts that might facilitate reporting led to 10 themes including reporting aids athletic performance post-concussion, helps the team, will result in a quicker return to play, facilitates healthy and safe return to play, protects the brain, is part of risk aversion, protects against long-term health implications, will be supported by my coach, will be supported by my teammates, and has academic advantages. The implications of the results with respect to facilitating a culture that supports pro-safety behaviors in collegiate student-athletes will be discussed.

Neurocognitive Functioning, Memory Recall and Recognition in Patients with Parkinson's Disease
Statement of the Problem: Parkinson’s disease (PD) is a neurological disorder characterized primarily by motor deficits. However, cognitive impairment (CI) is a common non-motor complication of PD. Similar to motor symptoms, cognitive concerns in PD can be quite variable
and often involve problems with memory functioning. The present study was aimed at examining the overall neurocognitive functioning of patients with PD in comparison to patients with dementia, mild cognitive impairment and normal age-appropriate cognitive functioning. Additionally, the study aimed at exploring the pattern of memory deficits specific to PD, since research indicates that memory concerns in cortical syndromes (e.g., Alzheimer’s Disease) differ from those in sub-cortical disorders, such as PD.

Subjects and Procedure: The present study involved a sample of 157 adults aged 56 to 96 who were seen for a neuropsychological evaluation at an outpatient neuropsychological clinic in Virginia. Most participants (70%) were community-dwelling, with approximately one third (30%) living in settings with various levels of assisted care (e.g., assisted living, nursing care, etc.). Average age of participants was 73.14 (SD = 8.36) with an average MMSE score of 22.46 (SD = 5.10) and average education level of 14.10 years (SD = 2.71). All participants completed the Mattis Dementia Rating Scale-2 (DRS-2) and the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) as part of a comprehensive neuropsychological assessment battery.

Results: Results revealed that the pattern of memory deficits in PD patients was significantly different from the memory profile of dementia patients in many respects. Specifically, in the studied sample patients with PD scored significantly higher (better) than patients with dementia on the following RBANS subtests: List Learning, Story Memory, Story Recall, and Figure Recall. Further, patients with PD performed significantly lower (worse) on these subtests than their normally aging peers. Findings also revealed that participants in all groups scored relatively high on the List Recognition subtest, and performance on that task was “least impaired” across all groups (even dementia group scored on average 15 out of 20 items correctly). Overall, performance of patients with PD on List Recognition did not differ significantly from patients with dementia or from normally aging patients. Finally, it is of note that patients with PD performed just as poorly as patients with dementia on a measure of List Recall (which involves free verbal recall) and their scores were significantly lower as compared to normal aging group, indicating that within the studied sample patients with PD displayed most difficulty with free verbal recall, as compared to other memory tasks.

Conclusions: Given the high prevalence of CI in PD, it is of critical importance to gain a better understanding of the patterns of cognitive deficits associated with PD in order to inform treatment and tailor interventions specific to PD patients. Such interventions may focus on compensatory strategies for areas of deficit and capitalize on cognitive strengths revealed in this study. Additional clinical implications of the findings will be further discussed in this presentation.

COLLEN, M.D., CARY, A., ORD, A., MAGNANTE, A., MCAULIFFE, R., KASS, A., SHULL, E., MORALES, K., SAUTTER, S.
Psychosocial Stressors & Neurocognitive Functioning in Older Adults

Statement of the Problem: Published literature indicates that psychological and social stressors have negative impacts on health. Further, recent studies reveal that in addition to multiple negative physiological and psychological consequences, chronic stress may have adverse effects on neurocognitive functioning. Additionally, it is widely known that increasing age has also been linked to declining cognitive functioning. However, there is scarcity of research examining the compound effect of multiple stressors on neurocognitive functioning in older adults. This study is aimed at bridging this gap in published literature.
Subjects and Procedure: The present study involved a sample of 363 adults aged 55 to 96 who were seen for a neuropsychological evaluation at an outpatient neuropsychological clinic in Virginia. Most participants (70%) were community-dwelling, with approximately one third (30%) living in settings with various levels of assisted care (e.g., assisted living, nursing care, etc.). Average age of participants was 73.19 (SD = 8.87) with an average MMSE score of 23.11 (SD = 5.03) and average education level of 13.97 years (SD = 4.29). All participants completed the Mattis Dementia Rating Scale-2 (DRS-2) and the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) as part of a comprehensive neuropsychological assessment battery. Additionally, participants were asked about a variety of stressors that they experienced in their lives, including financial stressors, relational stressors, and stress related to their place of residence. Participants were divided into 4 groups: (1) those who endorsed stressors in all three areas, (2) stressors in two areas, (3) stressors in one area, and (4) those who denied any stressors in the aforementioned categories.

Results: Results of the present study revealed statistically significant differences among the four groups in neurocognitive functioning, as measured by the DRS-2 Total Raw Scores and the RBANS Total Index Scores. First analysis of variance (ANOVA) indicated a statistically significant difference in DRS-2 total scores among participants with various levels of stressors, F(3, 359) = 5.39, p = .001. Specifically, participants who endorsed stressors in all three areas on average performed significantly worse than participants who reported no stressors or stressors only in one area. Second ANOVA revealed statistically significant differences in RBANS Total Scale scores among participants with different levels of stressors, F(3, 357) = 13.02, p < .001. In that analysis, participants who endorsed multiple stressors (in two or three areas) performed significantly worse than participants who reported no stressors or stressors only in one area. Overall, findings indicate statistically significant differences (with a small to medium effect size) in neurocognitive functioning between patients who reported lower levels of stressors as compared to those who reported higher levels of stressors.

Conclusion: The relationship between psychosocial stress and cognitive decline is complex, but better understanding of this association is imperative in order to inform treatment and tailor interventions specific for older adults who experience neurocognitive decline. Such interventions are discussed in the present study. Clinical implications for the findings will be further discussed in this presentation.

VIDEILA-NASH, G.
An examination of cognitive abilities in depressive disorders

Background: Cognitive deficits are prominent and prevalent in many psychiatric illnesses including major depressive disorder (Trivedi, 2006). These deficits and symptoms contribute to significant functional impairments in affected individuals resulting in sick days, reduced productivity, impairment in activities of daily living, and quality of life (Stamm, Pieber, Crevenna, & Dorner, 2016). The research literature suggests that dysfunctional cognitive abilities accompany depressive disorders (e.g., declarative memory; Zakzanis, Kaplan, & Leach, 1998). Cognitive performance correlated with depressive symptoms and at least one cognitive domain were affected by depression (Nakling et al., 2017).

Research Question and Hypotheses: The present study will examine whether neuropsychological test performance correlates with severity of depression; and if so, can neuropsychological tests predict functional abilities in those that show symptoms of subclinical depression (individuals that have depressive symptoms but do not meet the criteria for a depressive disorder). We
hypothesize that objective neuropsychological test scores will negatively correlate with depression severity. Further, we hypothesize that neuropsychological test scores will predict functional impairment in individuals with subclinical depression.

Method: A sample of undergraduate students (N = 150) will be recruited from the University of Toronto undergraduate participant pool through SONA (research participation system). We will use a sample of adults in order that shows subclinical symptoms to examine the validity in neuropsychological assessments on depression severity, and its reliability to predict functional disabilities. Eligibility requirements for this research include (1) 18 years of age or older, (2) fluency in English. Participants that consent to participate will complete a test protocol in the research lab. A demographics form will be collected, then cognitive functioning will be measured by Brain-Screen (Zakzanis & Azarbehi, 2014), a computer-based neuropsychological battery will be administered to assess the following neurocognitive domains: sustained and selective attention speed and accuracy, working memory, learning, retrieval, orientation, visual-spatial skills, problem-solving, reaction time, and information processing. The Beck Depression Inventory-2 (BDI-2; Beck, Steer, & Brown, 1996) will be used to measure depression symptom severity. The World Health Organization Disability Assessment Schedule 2.0 (WHODAS-2.0; .Stün et al., 2010) will be used to measure levels of functioning in multiple domains: list domains here. Participants will be debriefed upon completion of the protocol.

Analyses: Pearson's correlation will be used to examine the relationship between neuropsychological test performance and depression symptom severity. Based on these results, we will examine whether neuropsychological domains and depressive severity are predictive of functional outcomes.

Results: Data is currently being collected.

Conclusions: It is essential to create more precise characterizations of the impairment that arises from sub-clinical populations in order to treat them before a depressive disorder can be diagnosed. We can discover which variables are prominent in the subclinical depression and then their influence on functional outcomes. Targeting these variables early on can additionally create treatment plans that are effective for those individuals showing a subset of the symptom criteria in depressive disorders.


Considerations for the Multi-Disciplinary Assessment of FASD with Adult Women Parenting an Infant

Fetal Alcohol Spectrum Disorder (FASD) is a neurodevelopmental disorder, resulting from prenatal alcohol exposure, marked by a spectrum of developmental delays and cognitive impairments. While FASD is typically diagnosed in childhood, there has been emerging emphasis for diagnostic services for adults which would benefit those who did not have the opportunity to be assessed as children. This is particularly important given the persistence of symptoms throughout the lifespan and benefits of intervention and access to resources. Adults with FASD are at high risk for alcohol/substance abuse, trauma, legal troubles, and parenting difficulties including losing custody of their children. Unfortunately, little is known about the benefits/risks of receiving an FASD diagnosis in adulthood, particularly for women who are pregnant or parenting. The Adult Diagnosis of FASD Project is examining women’s experiences of receiving an FASD diagnosis and its impact on their quality of life and parenting capacity through an integrated community-based health and social resource program that supports women
during pregnancy and early parenting. We present the current case to highlight considerations and recommendations for multi-disciplinary diagnostic assessment of FASD in adulthood, including test selection, assessment process, gender, culture and trauma-informed approaches, and interpretation/sharing of results.

Client (C1) was a 31-year-old Indigenous woman with a history of trauma, self-harm, unemployment, substance abuse, and concerns with attention, communication, and adaptive functioning. A collaborative multi-disciplinary assessment (Medicine, Social Work, and Neuropsychology) was conducted utilizing Cook et al. (2015) guidelines. The medical evaluation focused on medical history, confirmation of prenatal alcohol exposure, and presence of sentinel facial features. The social work assessment focused on developmental history and current needs. The neuropsychological assessment focused on identification of cognitive strengths and deficits with careful selection of measures to address administration time, assessment reliability and validity, reduce redundancy, and minimize fatigue/stress.

Medical and social work assessment revealed multiple pre- and post-natal risk factors including confirmed in utero exposure to alcohol and multi-generational trauma. Neuropsychological assessment revealed significant impairment (> 2 SD below mean) on intellectual, attention, memory, executive function (e.g., working memory), language, adaptive behavior, and motor measures. Moderate impairment (1.5 - 2 SD) in academics and affect regulation was evident. Interpretation of results involved a careful consideration of developmental history and culture, including accounting for the potential impact of trauma and acquired brain injury. C1 met criteria for FASD without Sentinel Facial Features, and mild Intellectual Disability.

These results will be discussed in the context of the Cook et al. (2015) diagnostic guidelines, with particular focus on utilizing an assessment and feedback approach that extends beyond diagnosis to provide information that is supportive and relevant for the client’s stage of life. The importance of using a gender, cultural and trauma-informed approach to multidisciplinary assessment of FASD in adults will be discussed, including specific strategies that promote safety, trust, and collaboration with their diagnostic team. Specific accommodations that were necessary to maximize neuropsychological test reliability/validity, including literacy considerations, will also be discussed within the context of this population.

TRAN, V., GARCIA, J., CAPP, K., RADMANESH, D., LENOX, M.
Beliefs About Hypertension and Risk of Alzheimer's Disease

Objective: The U.S. population is currently undergoing a major demographic transition, with increasing racial and ethnic diversity of the older adult population. Hypertension (HTN) which is widely accepted as a risk factor for the development of dementias such Alzheimer’s disease (AD) disproportionately impacts racial minorities and thus put them at increased risk for the development and worsening of the disease. This study examined the impact of HTN on cognition across different racial/ethnic groups as well as current sociodemographic factors which may impact diagnostic and treatment outcome.

Method: Data analyzed was derived from a de-identified database of participants from the National Alzheimer’s Coordinating Center (NACC). The current study consisted of 9,017 subjects, aged 65 and older (52.5% male, MEd=15.57 years, SDEd=5.83 years) sorted into three groups 1) White [81.3%], 2) African-American [15.7%], and 3) Asian-American [3.0%]. All subjects completed a neuropsychological battery. A MANCOVA was conducted to compare the groups’ performance in various cognitive domains.
Results: A MANCOVA revealed a significant overall effect for the model at α=.05, Wilk’s Λ =.909, F(26, 18000)=33.95, p<.001. Education was included as a covariate. The Asian group exhibited less impairment than did the White group, and the White group exhibited less impairment than did the African-American group on tests of verbal memory, simple attention, working memory, confrontational naming, processing speed, and executive function. Conclusions: It is estimated that forty percent of African-Americans have HTN, and HTN increases the risk of developing AD (Marfany et al., 2018). Results of the current study found HTN had the greatest impact on cognitive functioning in an African-American group with AD. This impact is regrettable, as HTN is one of the most modifiable risk factors for AD; anti-hypertensive medications can effectively regulate the condition. However, African-American beliefs about HTN appear to be discordant with those of their clinicians. These discrepant beliefs may be a function of less access to health care, poor health literacy, and a mistrust of the healthcare system. African-American beliefs about HTN and healthcare represent a significant barrier to treatment. Consequently, clinicians must increase efforts to provide effective psychoeducation, address discordant beliefs, and remove barriers between African-Americans and HTN treatment.

MCMANUS, K.L.
Traumatic Brain Injury and Sleep Disturbance: Effectiveness of Interventions
Sleep disturbance among individuals with traumatic brain injury (TBI) is a leading cause of disability worldwide with millions of Americans being affected each year. There is great uncertainty as to why individuals with TBI, particularly those who are admitted to a hospital for care, are at a much higher risk of experiencing sleep disturbance than the general population. Sleep disturbance can impede the healing process of TBI patients, negatively affecting their cognition, mood, appetite, motivation, and overall functioning. Understanding the impact of traumatic brain injury and the effectiveness of various treatment options is extremely important since rates of TBI are expected to rise as the nation ages and accessible and affordable treatment will become more sought after. In this paper, several studies are explored that examine various treatment options and discuss the strengths, weaknesses, limitations, and results of each.

MCMANUS, K.L.
Sleep Loss and the Self-Care Dilemma for Psychologists and Trainees
Sleep loss is a major complaint among individuals who seek therapy and neuropsychological testing, yet it is also a major complaint and area of concern among doctoral students and psychologists as well. As of 2011, 50 to 70 million American adults had received a sleep disorder diagnosis and as of 2017, this statistic was expected to rise dramatically. By exploring various studies that examined the impact of sleep loss on cognition, memory, attention, and executive functioning on healthcare professionals and graduate students, evidence was found showing a greater need for self-care among these groups. Although “sleep doctors,” or clinical psychologists who specialize in treating sleep disorders frequently encourage their patients to attain more sleep, follow a strict sleep schedule, and implement good sleep hygiene practices, current research shows that clinical psychologists, more often than not, neglect their own physical and psychological needs in order to meet the needs of their clients and patients. Psychologists are more prone to burn out and emotional exhaustion than many other professions due to the intimate and traumatic nature of their work there by creating a greater need for rest and reflection. By educating doctoral psychology students on the importance of self-care earlier
BURGESS, J., GOLDEN, C.J.
Comparing Executive Function Between Outpatient Psychiatric and Neuropsychological Patients

Statement of problem: The aim of this study was to investigate how those diagnosed with a psychiatric disorder differ from those diagnosed with a neuropsychological disorder on tests of executive function.

Methods: The data were chosen from a de-identified database in the Nova Southeastern University Neuropsychology Assessment Center (NAC). The sample chosen (N=275) was comprised of adults diagnosed with Major Depressive disorder (MDD) (n=75), Anxiety Disorder (n=73), Adjustment Disorder (n=48), and Cognitive Disorder, Not Otherwise Specified (Cognitive Disorder) (n=79). NAC is also an outpatient clinic, so these patients’ disorders were only of mild to moderate severity. The participants were predominantly female (54.7%) and Caucasian (62.2%) with a mean education of 13.77 years (SD=2.54). The participants ranged from age 16 to 77 with a mean age of 32.26 (SD=12.90). Age and education differed between groups and were used as covariates. T-scores on tests of executive function – Category Test number of errors (Category), Trail Making Test-B number of seconds (TMT-B), Stroop Color/Word, Stroop Interference, Wisconsin Card Sorting Test number of perseverative errors (WCST perseverative errors), and Wisconsin Card Sorting Test number of total errors (WCST total errors) – were ran as dependent variables.

Results: Results of an ANCOVA revealed significant differences at the p<. 01 level on Category (?2= .06), TMT-B (?2= .12), and WCST perseverative errors (?2= .11). Bonferroni-corrected pairwise comparisons revealed that those diagnosed with Cognitive Disorder had a lower Category T-score (M=34.93) than those with Anxiety (M=43.36). On TMT-B, Cognitive Disorder scored lower (M= 35.25) than MDD (M=44.01), Anxiety (M=46.29), and Adjustment Disorder (M=43.71). On WCST Perseverative Errors, MDD (M=19.50) made more perseverative errors than Anxiety (13.25), and Cognitive Disorder (34.93) made more perseverative errors than Anxiety and Adjustment Disorder (16.09).

Conclusion: Due to how often neuropsychologists use tests of executive function, this study sought to see if these assessments could be used to distinguish between psychiatric and neuropsychological disorders. Results show that the Category Test was able to distinguish Cognitive Disorder from Anxiety. TMT-B was the most efficacious at differentiating Cognitive Disorder from all three of the psychiatric disorders. WCST perseverative errors were able to differentiate MDD and Anxiety, as well as Cognitive Disorder from Anxiety and Adjustment disorder. These findings indicate that the Category Test can differentiate neuropsychological disorders from Anxiety, but perhaps not from other psychiatric disorders. TMT-B may be most effective at exposing deficits in those with neuropsychological disorders, and the WCST may be most sensitive to differentiating between psychiatric disorders, while still being sensitive to neuropsychological disorders.

TRINIDAD, B., PALACIOS, D., GOLDEN, C.J., AMEN, D., WILLEUMIER, K., TAYLOR, D.
SPECT Differences Between Patients with OCD and Comorbid OCD/GAD in a Child Sample

Objective: To assess whether diagnosed Obsessive Compulsive Disorder (OCD) and comorbid Generalized Anxiety Disorder (GAD) and OCD diagnoses interactively alter brain activity, as measured by a single photon emission computed tomography (SPECT) imaging.

Method: The participants were part of a large archival de-identified database made up of 3,435 children that received SPECT scans. Participants were selected based on diagnosed disorders made with the DSM-IV. The sample (n=216) included a group of children diagnosed with OCD (n=118) were primarily male (68.6%), Caucasian (45.8%), and had a mean age of 12.86. The second group of children were diagnosed with comorbid OCD and GAD (n=98) were primarily male (65.3%), Caucasian (31.6%), and had a mean age of 12.54. Exclusion criteria included participants with traumatic brain injury, schizophrenia or psychosis. Cerebral blood flow (CBF) was assessed using SPECT scan at baseline in 17 brain areas.

Results: A one-way between subjects ANOVA was conducted to determine a statistical significant between diagnoses and perfusion. Age and gender were used as covariates. Results showed hyper-perfusion in the OCD group in the left Limbic F(1,212) = 7.329, p<.007. Furthermore, hyper-perfusion in the comorbid OCD and GAD group was found in the right Motor Sensory F(1,212) = 17.168, p<.001. Conclusion: Results indicate that children who are diagnosed with OCD showed greater activation in the left limbic. Past research has shown that dysregulation in subcortical regions is associated with impaired executive performance and inability to inhibit cognition in patients with OCD thus limiting the control over such functions. Specific limbic regions are well-known to play a role in broadly mediating anxiety therefore, potentially accounting for the increased anxiety in one group and not the other (Carey et al., 2004). The limbic areas also assess the content of internal and external stimuli and regulates context-dependent behaviors (Devinsky, Morrell, & Vogt, 1995). The children with OCD may feel control after completing rituals. The pattern of increased activity in the left hemisphere may develop in early childhood congruent with our findings of overactivation in the left limbic. Children with comorbid OCD and GAD may not have the additional emotional regulation components of the limbic system. These children may have a harder time processing emotion therefore, increasing their rituals and dependent behaviors activating the right motor sensory which is more involved in processing sensory and motor information than the left. Similar to adults, the emotional processing of the limbic may become over stimulated by the increasing number of responsibilities paired with unrealistic thoughts which may lead to anxiety. In addition, an under-developed frontal lobe may impact the capability to adjust emotions thus causing anxiety and use of rituals. Research has shown that mindfulness training often leads to changes in the frontal-limbic areas crucial for the regulation of emotions therefore, future analysis should investigate the progression of OCD in relation to rituals.

HORNE, K., DATOC, A., HADORN-PAPKE, D., GILMORE, M., GOLDEN, C.J.
The Relationship Between WAIS-IV Index Scores and Executive Function Performance

Objective: This study examined the relationship between all Wechsler Adult Intelligence Scale-IV (WAIS-IV) index scores and performance on measures of executive function.

Method: Data derived from de-identified database of clinical adults (n=319, Mage= 33.6, Caucasian=53%, Female=54%). The sample consisted primarily of individuals diagnosed with Learning Disorder with impairment in mathematics (n=32, 10.0%), Learning Disorder with impairment in reading (n=32, 10.0%), Unspecified Neurocognitive Disorder (n=22, 6.9%),
Anxiety Disorder (n=21, 6.6%), and Adjustment Disorder (n=19, 6.0%). Participants were administered the WAIS-IV and executive function measures. The indices that were assessed included Processing Speed Index (PSI), Working Memory Index (WMI), Verbal Comprehension Index (VCI), and Perceptual Reasoning Index (PRI), along with Full Scale Intelligence Quotient (FSIQ). Executive function measures that were assessed included the Stroop Test, Category Test, Trail Making Test (TMT-B), and Wisconsin Card Sorting Test (WCST).

Results: A Pearson correlation was conducted between all WAIS-IV indexes and the T-scores from the Stroop Color, Stroop Word, Stroop Color-Word, and Stroop Interference, Category Errors, TMT-B, and WCST Perseverative Errors. At p<.05, Stroop Word T-scores were significantly correlated with PSI(r=.437), WMI(r=.273), PRI(r=.115), VCI(.140), and FSIQ (r=.231). Stroop Color T-scores were significantly correlated with PSI(r=.463), WMI (r=.347), PRI(r=.280), VCI(r=.196), and FSIQ(r=.363) at p<.05. Stroop Color-Word T-scores were significantly correlated with PSI(r=.430), WMI(r=.293), PRI(r=.353), VCI(r=.203), and FSIQ(r=.346). At p<.05 Stroop Interference T-scores were significantly correlated with PSI (r=.155), WMI(r=.130), PRI(r=.246), VCI(r=.171), and FSIQ(r=.197). Category errors were significantly correlated with PSI(r=.360), WMI(r=.355), PRI(r=.490), VCI(r=.402), and FSIQ (r=.476) at p<.05. WCST Perseverative Errors were significantly correlated with PSI (r=.354), WMI(r=.381), PRI(r=.428), VCI(r=.373), and FSIQ(r=.424) at p<.05. Additionally, TMT-B T-scores were significantly correlated with PSI(r=.506), WMI (r=.404), PRI(r=.377), VCI(r=.284), and FSIQ(r=.420) at p<.05. Conclusion: The overall results suggest that there is a significant relationship between WAIS-IV index scores and executive function performance. With the exception of the WCST, all of the measures suggested that elevations on WAIS-IV index scores were associated with higher scores on executive functioning measures. The negative correlations between WCST Perseverative Errors T-score and PSI, WMI, PRI, VCI, and FSIQ suggest that elevations on the WAIS-IV indices are associated with lower scores on the executive function measure. Due to the sample being largely made up of learning, neurocognitive, anxiety, and adjustment disorders, it is not surprising that the results were mostly positive correlations between WAIS-IV index scores and executive function measures. Typically, deficits in executive function measures are found in disorders including but not limited to Attention Deficit Hyperactivity Disorder, Conduct Disorder, Major Depressive Disorder, Obsessive Compulsive Disorder. (Executive Functions, 2012). Further research should aim to examine these findings in a more representative clinical sample with various other disorders.

ROBLEDO, R., LEWIS, D., VALDEZ, A.
Mono/Bilingual Neuropsychological Evaluations with Spanish Speakers: A Qualitative Review

Spanish-speakers are a consistently growing population in the United States. Few neuropsychologists identify as bilingual (English-Spanish) in the United States and no standard has been proposed regarding the process of an evaluation of Spanish-speaking clients by monolingual (English) or bilingual (English-Spanish) neuropsychologists. The lack of bilingual provides the assumption Hispanic individuals may not have adequate access to needed neuropsychological services. This study examined the evaluation process used by monolingual (English) versus bilingual neuropsychologists with monolingual (Spanish) and bilingual clients. This research utilized a qualitative method and implemented semi-structured telephone interviews with six monolingual (English) providers from Arizona (a highly Hispanic populated
state) and five bilingual providers from Florida, Seattle and Mexico. Participants were asked how often they evaluated Spanish speaking clients, the practice of and/or decision to use interpreters, the evaluation tools selected, and the process of the evaluation. Results indicated monolingual (English) providers lacked awareness of tools normed for Spanish speakers, chose not to work with those individuals despite the frequency of Spanish speakers seeking services, and needed information of appropriate referral resources. The bilingual providers frequently worked with Spanish speakers, were more aware of assessment tools normed for Spanish speakers, had referral sources for clients outside their cultural and linguistic competence, and had a more nuanced conception of how to work with Spanish speakers. This study discussed the importance of considering diversity factors in neuropsychological evaluations to arrive at accurate diagnoses and offer effective treatment options; the issues with ignoring diversity factors; and proposed a plan for both monolingual and bilingual neuropsychologists when conceptualizing the evaluation process with Spanish-speaking clients.

**DOROTA, B., PETERMANN, F.**

**Relationships between Executive Functions, general intelligence, and specific intelligence domains**

Considerable evidence exists on a strong association between executive functions (EFs) and intelligence. However, it is not well explored exactly how the particular components of the two constructs are interrelated. The aim of the study was to explore the relationship between EFs and general intelligence (g) as well as more specific intelligence domains. Additionally, the influence of the type of EF task on the relationship between both constructs was intended to be examined.

Data from five subtests of the Executive Functions Module of the German Neuropsychological Assessment Battery (NAB) and ten core subtests of the German Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV) were used to examine the relationship between EFs and intelligence in healthy individuals aged 18-88 (M = 54.83, SD = 18.23) years (N = 126). Strong relationships between the two constructs were particularly demonstrated by the composite scores of the assessment tools used: Correlation between the NAB Executive Functions Index (EFI) and the WAIS-IV Full Scale IQ (FSIQ), r = .71, and WAIS-IV General Ability Index (GAI), r = .65; and by complex EF tasks: Average correlation between the four WAIS-IV indices – Verbal Comprehension Index (VCI), Perceptual Reasoning Index (PRI), Working Memory Index (WMI), and Processing Speed Index (PSI) and NAB subtests Categories, r = .46, and Word Generation, r = .45. By contrast, EF tasks involving specific skills were substantially related only to the WAIS-IV indices involving similar skills: Mazes and PRI, r = .35, and PSI, r = .42; Letter Fluency and VCI, r = .45, and WMI, r = .42.

Thus, when interpreting the composite and complex task scores of EF measures, g or the current and premorbid IQ must be taken into consideration. By contrast, EF tasks involving specific skills appear to be significantly related only to the intelligence components involving similar skills. Hence, potential dysfunctions in those specific skills, e.g., language or processing speed, must be considered rather than g.

**SONG, H., IM, M., SOHN, E., KIM, Y., JEONG, H., CHOI, J.**

**Development of Mobile App('CoCon') of Evaluating Cognitive Control Ability in Children & Adolescents**
Usually, it is very difficult to approach and to detect reliably and validly high-risk groups in children and adolescents. Most current diagnostic systems has been criticized not represent real behaviors reliably and validly. Therefore, it is very important to find methods to evaluate appropriately their problems and needs. In the time of waiting the 4th industry revolution, there would be no disagreement to propose that game is the most powerful platform to approach the group of children and adolescents. In this context, CoCon was developed based on the method of gamification including a story in which a detective is trying to investigate a thief in a gallery. While users enjoy the game, their cognitive control abilities are evaluated behind the scenes. The aim of CoCon is to screen a high-risk group, which has difficulty regulating their impulsivity in order to prevent game addiction, ADHD, and other cognitive control-related problems or to intervene at an early stage. CoCon was designed to collect big data in which included a reaction time, numbers of correct responses and wrong responses, number of log-ins, number of pauses, other activities like number of checking their achievements. These data were designed to represent the users’ behavior in vivo. A total of six games are included, which evaluate sustained attention, working memory, inhibitory ability, response selection and categorization. CoCon was developed based on traditional experimental paradigms. It was adopted the Stroop task, the Flanker task and the GoNoGo task. Especially, the auditory GoNoGo task was newly developed for CoCon using a paradigm validated in the previous study by our team. The Stroop Task and Flanker task were adopted in the Stop signal game in which two experimental tasks were transformed in various ways retaining its unique characteristics of the original tasks. In particular, CoCon adopted a challengeable methodology in which each game has a unique algorithm to calculate the performances according to the characteristics of each game including a difficulty and a longevity etc. An adaptive staircase method was adapted to produce a unique algorithm of each game. As a result, some users should stay in CoCon relatively during a longer time than other users. Interestingly, total game staying time was not related to their IQ or other cognitive abilities. A rigorous validation study was conducted in the participants with 11-16 years old. Our preliminary data showed that variables of CoCon were significantly related to IQ. CTT, Stroop and a self-reported executive function. For example, a correct response ratio(r=.536, p<.01) and the numbers of pauses (r=-.420, p<.05) were significantly related to total IQ score. The correct number of emotion stimulating task was significantly related to Stroop test(r=.614, p<.01). In addition, numbers of checking their performances were significantly related to self-reported executive function task (r=.476, p<.05). In conclusion, CoCon was designed as the game to represent behaviors in a real environment and it was expected that it could get huge data to be able to create more practical and ecological category to represent problematic areas related with cognitive control in children and adolescents. The final goal of CoCon is to categorize the responses showed in playing the game and to get an insight to new diagnostic categories related to cognitive control ability.

EXLINE, A.
Neuropsychological Considerations for Adiposity Induced Neuronal Atrophy During Midlife

As the brain ages, there is an expected amount of atrophy that occurs. Current literature has examined the consequences of obesity in midlife which may accelerate premature aging. Adiposity is a condition of being severely overweight or obese, often measured by body mass index (BMI). In the United States, more than ? of adults are obese, however, the prevalence is highest among middle-aged adults. Obesity in midlife is related to worse cognitive performance,
especially executive function which can be a result from the atrophy may occur. This atrophy is characterized by the reduction of brain tissue volume and cortical thickness which happens over time as compared to healthy adults. This can be due to combinations of reduced synaptic density, dendritic arborization, the corpuscular volume of neurons and glia, and cell death. Higher adiposity can be associated with greater atrophy of gray matter in the frontal, parietal and temporal regions, as well as, decreased white matter microstructural integrity. In addition to these effects, obesity is a risk factor for other mental health problems such as depression. The current research finds that most physicians are more concerned with a patient’s physical health and the patient's mental health often gets overlooked. An understanding of the impact that obesity can have on the brain and functioning is vital for optimal physical health as well as psychological health as midlife adults continue to age. Preventative care and interventions such as bariatric surgery, calorie restriction, and light exercise can help mediate the effects of obesity-related impairment as well as reduce the progression of cognitive decline in dementia cases.

KRUMHOLZ, M.F., PINNELL, C., WECHSLER, F.
The Effectiveness of Brief-Mindfulness Practice for Enhancing Attention
Attentional control is a prominent component of mindfulness practice. Mindfulness training utilizes one’s ability to continuously focus and refocus attention. The current study examined four research questions and five hypotheses regarding effects of a brief mindfulness-based intervention (MBI) on state mindfulness, trait mindfulness, and attention. This research investigated whether administration of a brief MBI in either mass or spaced-interval format related to state, trait, or attentional changes. The first two hypotheses posited that a positive correlation would exist between attention and both state and trait mindfulness, respectively. Remaining hypotheses examined whether differences existed between administration formats on measures of state mindfulness, trait mindfulness, and attention. Participants were graduate students enrolled in psychology Master’s or Doctorate programs (N=42). Measures included a demographic questionnaire, the State MAAS, the Trait MAAS, and the Seashore Rhythm Test. Participants were administered four audio sessions in either the mass (met once per day for four consecutive days) or spaced-interval format (met once per week for four consecutive weeks). Results indicated that no significant differences existed between administration formats of the brief-MBI. All participants’ scores increased significantly on measures of the State MAAS and the Seashore Rhythm Test following the intervention. No positive correlations existed between attention and state or trait mindfulness. Scores of the Trait MAAS did not demonstrate significance following the brief-MBI. Results suggest that participation in the brief-MBI significantly impacted participants’ level of state mindfulness and attentional ability; however, participants’ attentional ability and level of state mindfulness were not related. Results also indicated that the brief-MBI significantly increased participant’s state mindfulness and attention scores, regardless of the brief-MBI format. Given the sample of graduate students, results suggest that brief-mindfulness is effective for enhancing the attentional ability for persons of a varying age and life stage. Extensions of this research using additional measures of attention and executive functioning would be helpful in determining which formats of mindfulness training lead to the greatest positive correlations with attention. Additionally, determining the length of time of a brief-MBI that is necessary to produce significant changes in certain areas would further knowledge of which style of mindfulness practice is the most beneficial for increasing specific changes. Finally, exploring whether particular traits of mindfulness mediate the attentional benefits gained from practicing would be helpful in creating a foundation of research
determining which format of training would be most helpful based on one’s disposition. By
continuing to identify whether relationships exist between mindfulness training and attention,
these variables and the contributing dynamics will continue to be more strongly defined.
Moreover, the results of this study may serve as a pilot for further investigation of the
neurological bases of attention within mindfulness meditation because it utilizes an attentional
measure that can be conducted during neuroimaging. Additional research using neuroimaging
would lend to enhance understanding of the attentional networks involved in mindfulness
interventions.

MCDONALD, B., DATOC, A., DERBALY, A., LASHLEY, L., GOLDEN, C.J.
Impact of Sleep Duration on Baseline Neuropsychological Testing in Collegiate Athletes
Objective: To examine the effect of sleep duration on cognitive functioning on the Immediate
Post-Concussion Assessment and Cognitive Testing (ImPACT) in collegiate athletes at baseline.
Method: Data was derived from a de-identified ImPACT database in South Florida from 2012 to
2018. The sample consisted of 779 college athletes aged 17-25 (Mage=19.54, SD=1.65) and was
primarily female (60.9%). Participants were divided into three groups based on their sleep
duration the night before testing: 1=less than 7 hours (n=361), 2=7.5 hours to 8.5 (n=371), and
3=greater than 9 hours (n=47). An ANOVA was conducted to test for significant differences
between number of hours slept the night before testing and ImPACT performance on the five
composite scales at baseline.
Results: ANOVA (alpha<.01) revealed no significant differences between all five composites on
baseline ImPACT (Verbal Memory [F(2,776)=2.290, p=.102], Visual Memory [F (2,776)=.051,
p=.950], Visual-Motor Speed [F(2,776)=3.864, p=.021], Reaction Time [F (2,776)=1.641,
p=.194], or Impulse Control [F(2,776)=.645, p=.525]).
Conclusion: Preliminary results suggest a collegiate athlete’s duration of sleep the night before
completing ImPACT at baseline does not influence their neurocognitive performance. This
conflicts with prior research that has found poor sleep the night before testing to affect
functioning in various neuropsychological domains, such as Bennett, Burley, & Golden’s (2018)
findings that sleep groups in youth and adolescent athletes significantly differ on the Verbal
Memory, Visual-Motor Speed, and Impulse Control composites of ImPACT. These findings
suggest that sleep duration the night before completing ImPACT at baseline have greater
implications in youth and adolescent athletes in comparison to collegiate athletes. Limitations to
this study include the use of self-reported sleep duration information and lack of information
regarding quality of sleep. Future research is needed to further understand the effects of sleep on
neurocognitive functioning at baseline in collegiate athletes, specifically understanding how
duration and quality of sleep not only the night before testing, but also overall sleep patterns
contribute to neurocognitive functioning.

CABRERA, C., GOLDEN, C.J.
Can Literacy Skills Predict Working Memory?
Objective: This study compared performance on subscale scores of the Expressive Vocabulary
Test-Second Edition (EVT2), Peabody Picture Vocabulary Test (PPVT4), and Wide Range
Achievement Test-4 (WRAT-4) with the composite score of the Working Memory Index (WMI)
of the Wechsler Adult Intelligence Scale-IV (WAIS-IV).
Methods: Data was derived from a de-identified clinical database that included 69 adults (46%
males, Mage=33.4, Meducation=13.5). Participants were administered the WAIS-IV and
measures of vocabulary, reading, and spelling skills. The index that was assessed included Working Memory (WMI) of the WAIS-IV, which constitutes of Digit Span, Arithmetic, and Letter-Number Sequence. Measures of literacy included Reading, Sentence Comprehension, Spelling, and Reading Composite and were assessed using the WRAT-4.

Results: Verbal Comprehension Index (VCI) was used to control for Intelligence. Pearson correlations were made of the WAIS-IV WMI composite scores and scaled scores from the EVT-2, PPVT-4, and WRAT-4. At p = .01 with a CI of 95%, EVT-2 is moderately associated with WMI \((r(69) = .454)\), PPVT-4 is poorly associated with WMI \((r(69) = .224)\). Reading is moderately associated with WMI \((r(27) = .452)\), Sentence Comprehension is strongly associated with WMI \((r(25) = .743)\), Spelling is moderately associated with WMI \((r(26) = .389)\). Reading Composite is strongly associated with WMI \((r(25) = .684)\).

Conclusions: The overall results suggest that there is a relationship between literacy skills and working memory performance. With the exception of a small sample of participants, the results suggest that there is a relationship between vocabulary, spelling, and reading performances due to their shared role in phonological awareness and how proficiency in spelling enhances vocabulary growth and reading skills. The results indicate that elevations on the Reading Composite scores of the WRAT-4, obtained by combining the Word Reading and Sentence Comprehension standard scores, are strongly associated with higher scores in the WAIS-IV WMI composite score. Additionally, EVT2, but not PPVT-4, is moderately associated with higher scores on the WAIS-IV Working Memory subtests and may be linked to the synonym task required on many items of the EVT-2 that can be considered higher-level thinking than the simple recognition task required by the PPVT-4. The moderate association of the Spelling subtest to working memory can be connected to orthographic learning, where spelling patterns are committed to memory in a way where they can be retrieved automatically. As a result, this allows individuals to make automatic connections between spelling and pronunciation of words in memory. Strong performance in spelling is likely to positively affect word-recognition skills. Furthermore, individuals who perform poorly on measures of literacy skills may have a difficult time using context clues, predicting words when reading, or using decoding, all of which place a high demand on working memory. Lesions or impairment in the prefrontal cortex will increase the likelihood of significantly affecting performance on literacy skills and academia. Future studies should focus on the relationship of inattentive behaviors (e.g., ADHD) to performance on working memory tasks.

LOPEZ, A., DATOC, A., BENNETT, R., GOLDEN, C.J., AMEN, D., WILLEUMIER, K., TAYLOR, D.

Cerebral Blood Flow Differences in an Opioid Use Disorder Population

Objective: The aim of this study is to identify cerebral blood flow (CBF) differences between brain regions among individuals who have an opioid use disorder and healthy controls.

Methods: The data from this study was derived from a de-identified archival Single-Photon Emission Computed Tomography (SPECT) database. The sample included a healthy control group \((N=114)\) which had a mean age of 44.5 and was predominantly female \((54.87\%)\). The second group included individuals with a diagnosis of an opioid use disorder using DMS-IV criteria \((N=200)\), had a mean age of 32.88 and was predominantly male \((75.5\%)\). Significant differences were found for age \([t(312)=6.66, p<.001]\) and gender \([t(2)=30.78, p<.001]\) between groups. As a result, ANCOVAs were conducted to measure cerebral blood flow differences
across 17 brain regions using SPECT scans between the two groups while controlling for age and gender.

Results: Results showed significant differences between the two groups and perfusion in 5 brain regions after controlling for age and gender. Hypo-perfusion in the opioid group was observed in the right \(F(1,249)=18.325, p<.001\) and left limbic system \(F(1,249)=19.594, p<.001\). Less CBF was also observed in the right \(F(1,249)=20.063, p<.001\) and left basal ganglia \(F(1,251)=29.300, p<.001\). Hyper-perfusion in the opioid group was observed in the left side of the cerebellum \(F(1,249)=11.143, p=.001\).

Discussion: With the current opioid epidemic and the rapidly increasing need for treatment options for opioid related disorders, it is important to look at the effects of these narcotics on cortical areas and neuropsychological functioning. Consistent with past research on the effect of opioid use and the reward systems associated with the limbic system and the basal ganglia, we observed hypo-perfusion in these subcortical structures. Furthermore, previous literature also suggests memory impairments for this population, specifically difficulty with recall. Other areas of impairment such as emotion recognition and cognitive empathy have also been associated with opioid use, and these findings align with the significant differences in perfusion in the subcortical areas found in the present study. The cerebellum, which has been shown to be involved in motor and visual functions, showed increased activity in individuals with opioid use. This further supports evidence for visuospatial and psychomotor abilities that have been found to be associated with chronic opioid use. Results of the present study, in addition to findings from previous studies demonstrates the wide effect of opiates in the brain and provides the link between these subcortical areas and neuropsychological functioning. Our findings show that individuals suffering from opioid use disorder are experiencing difficulties in multiple areas of psychological functioning and these should be taken into account in the assessment and treatment of the disorder. Future research should explore the identification of more specific structures within the subcortical areas that have been found to be affected by the use of opioids, as well as their related neuropsychological effects. Limitations to the present study include the use of retrospective data, and unavailable information on the length of opioid use.


Confirmatory factor analysis of the ImPACT in high school athletes

Objective: The ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) is a widely used computerized battery for the assessment of cognitive abilities pre- and post-concussion. The ImPACT measures four cognitive dimensions: Verbal Memory (VerM), Visual Memory (VisM), Visual Motor Speed (VMS), and Reaction Time (RT). Independent results of two factor analyses suggest that a two-factor model (with Memory and Speed factors, rather than the current four-factor model) might better represent the latent structure of ImPACT’s composite scores (Gerrard et al., 2017; Schatz & Maerlander, 2013). The current study uses confirmatory factor analysis (CFA) to assess the fit of the four- and two-factor models described above.

Procedures: Participants included 22,679 high school athletes (mean age=15.1, mean education=9.2 years) who completed the ImPACT as a baseline prior to beginning their sport season. Athletes who reported a history of concussion or demonstrated invalid baselines were excluded. CFA was conducted using EQS 6.1 with case-robust methods.

Results: Because the chi-square test typically produces significant values due to detection of trivial differences in large samples (Byrne, 2006), the following fit indices were examined:
comparative fit index (CFI), incremental fit index (IFI), standardized root mean-squared residual (SRMR), and the root mean-square error of approximation (RMSEA). Results of the two-factor and the four-factor solution indicated mediocre to adequate – but not superior – fit. Comparison of the model using the Bozodogan’s (1987) consistent version of Akaike’s Information Criterion (CAIC) indicated that the four-factor model is a better fit for the data. Conclusions: Results indicate that both the two- and four-factor models provide adequate fit for the data. Even though goodness-of-fit indices were slightly better for the two-factor solution, CAIC suggested that the four-factor solution is a better, more parsimonious overall fit for the data. Future research should explore the factor structure of the ImPACT in different populations (e.g., those athletes with concussion history and/or those with ADHD).

Poster Session II


Impact of Positive & Negative Symptoms & Depression on Executive in Psychotic & Depressive Disorders

Statement of the problem: Studies show that negative symptoms have clinically significant associations with cognitive functions (Rabinowitz et al., 2012). Additionally, schizophrenic patients have difficulty using syntactic information due to deficits in verbal working memory (Li et al., 2018). When comparing schizophrenia and depression, studies show that neurocognitive abnormalities in motor speed, shifting, general intelligence, perceptual sensitivity, reversal learning, sustained attention, working memory and planning can be used to distinguish between the two (Liang et al., 2018). Lastly, it has been found that Semantic Clustering has been able to predict a decrease in verbal memory performance and learning strategies, suggesting diagnostic differences on a neuropsychological level between PMDs and schizophrenia spectrum groups (Gill et al., 2018). The goal of this study was to compare the predictive relationships of depression severity and positive and negative psychotic symptoms on executive functioning across patients (who have a diagnosis of psychotic major depression, schizoaffective disorder, or schizophrenia) with current mood and psychotic symptoms.

Subjects used: Data was collected from the Depression Research Clinic at the Department of Psychiatry and Behavioral Science at Stanford University School of Medicine (Gomez et al., 2006; Keller et al., 2006). Participants included 50 subjects diagnosed with Psychotic Major Depression who have the mean age of 36.90 years and 38 subjects with Schizoaffective or Schizophrenia Diagnosis with a mean age of 38.39 years.

Procedures: A neuropsychological battery, mood rating scales, and self-report questionnaires was given to all participants (see Gomez et al., 2006 for a list of complete measures). The measures included in the current study are the Hamilton Depression 24-Item Rating Scale, California Verbal Learning Test (CVLT), Stroop Color and Word Test, Controlled-Word Association Test (COWA), Trail Making Test, FAS, and Delis-Kaplan Executive Function System (DKEFS).

Results: Linear regressions indicated that depression significantly predicted Semantic Clustering in the CVLT (Beta=.27, p =.014 with an R2 of .117). It also indicated that that Positive symptoms (Beta=.29, p =.007 with an R2 of .205), and negative symptoms (Beta=-.38, p ≤.001) significantly predicted verbal letter fluency (FAS) (R2 of .205). Last, negative symptoms significantly predicted performance on a Category sorting test from the DKEFS (Beta=-.23, p =.039 with an R2 of .071). Linear regressions showed that positive symptoms, negative
symptoms and depression failed to significantly predict performance on the Stroop Color Word Test, COWA, and Trail Making Test. Conclusions: The findings of this study provides evidence that psychotic versus depression symptom severity differentially predicted types of executive functioning across psychotic and mood diagnostic groups. Specifically, memory strategy of grouping by categories was predicted by depression but not psychotic symptoms. Additionally, verbal fluency was predicted by positive and negative symptoms, but not depression. Lastly, categoric sorting of cards was predicted by negative symptoms. These findings suggest clinical value of a continuous approach in understanding executive function through depression and psychotic severity rather than through the categorical predictors of diagnostic groups.

WATOREK, V., FERGUSON, R.
Examining Loss of Set Performance and Cognitive Decline in an Older Adult Sample
Executive functioning is crucial for performance of daily tasks. Research has shown that individuals with mild cognitive impairment (MCI) and dementia exhibit more executive dysfunction than healthy controls. However, most studies have focused on total scores from neuropsychological measures rather than an analysis of errors. Loss of set (losing track of what one is doing) is one type of executive dysfunction that can be examined qualitatively in older adults who experience cognitive decline. Therefore, this study compared loss of set performance in 1,526 adults (M age = 69.57, SD = 9.79) using data from the National Alzheimer Coordinating Center (NACC) database. Participants were categorized into three groups according to their diagnosis at the initial visit: healthy controls (n = 863), those with MCI (n = 378), and those with dementia (n = 285). Measures of interest included Verbal Fluency Repetition Errors, Verbal Fluency Rule Violation Errors, and Trail B Switching Errors. The study also examined the relationship between loss of set and functional ability. Results showed that all error types were directly correlated with functional ability, p < .05. As expected, controls exhibited the least difficulty in functioning (M = 0.21, SD = 1.16), followed by the MCI group (M = 3.38, SD = 4.19), with the most difficulty seen in the Dementia group (M = 10.83, SD = 7.13), p < .01. All groups also differed in the number of Trail B switching errors made. Specifically, controls made the fewest errors (M = 0.55, SD = 0.98), followed by the MCI group (M = 1.28, SD = 2.76), with the most errors made by the Dementia group (M = 3.29, SD = 11.56), p < .05. Additionally, differences were seen in verbal fluency repetition errors, with the Dementia group exhibiting the most errors (M = 1.91, SD = 2.11), followed by the MCI group (M = 1.55, SD = 1.80), and the least errors made by the control group (M = 1.24, SD = 1.43), p < .05. Healthy controls (M = 0.59, SD = 1.15) also made fewer verbal fluency rule violations compared to both the MCI (M = 0.82, SD = 1.59) and Dementia (M = 0.95, SD = 1.58) groups, p < .05; however, there were no differences between the cognitively reduced groups, p > .05. Discriminant analysis of verbal repetition and nonverbal switching errors resulted in 49.9% accurate classification of diagnostic group at initial visit; however, when functional ability was added as a predictor, correct classification increased to 75.1%. When examining the predictability of diagnostic classification at the first follow-up visit (n = 1,434) using error performance alone, only 49.9% of participants were correctly categorized. However, when daily functioning was added, accurate classification increased to 74.2%. Overall, these findings demonstrate the direct relationship between loss of set and functional abilities. Moreover, the combined examination of loss of set performance related to verbal repetition and nonverbal switching errors as well as functional ability may be a useful predictor of cognitive status in older adults.
SOBER, J.D., KATSCHKE, J.L., WOODARD, J.L., NIELSON, K.A., SEIDENBERG, M., CARSON SMITH, J., DURGERIAN, S., RAO, S.M.

Auditory Verbal Learning Test Learning Slope Predicts Preclinical MCI in APOE e4 carriers

Declines in episodic memory are commonly leading indicators of preclinical dementia in older adults. However, baseline memory performance indexes have widely varying sensitivities to future cognitive decline. Learning slope is one such performance measure that reflects a process index that may be impacted by early memory pathology. However, there has been little investigation of whether early reductions in learning slope may be linked to risk for mild cognitive impairment (MCI). We examined the trajectory of learning curves across three time points in a 5-year prospective study of a well-defined group of apolipoprotein E (APOE) e4 carriers to identify potential markers of incipient MCI conversion. Twenty-nine initially healthy, older adult APOE e4 allele carriers (Mage = 71.9 years, SD = 4.4; 24% male) were administered the Rey Auditory Verbal Learning Test (AVLT) at baseline, at 1.5 years and at 5 years. Ten participants developed MCI according to Petersen criteria after 5 years. Using latent growth curve modeling, latent learning slope and intercept were calculated for each time point and were compared for persons who did and did not convert to MCI during the study period. A greater magnitude of difference between groups would be expected with each time point if slope and intercept declined more for persons with progressive cognitive decline. Using likelihood ratio tests, intercept (initial recall on trial 1) did not differ between non-converters and converters at baseline (7.0 words vs. 6.8 words, p=.762) or at 1.5 years (6.72 words vs. 6.1 words, p=.400), but they did differ at 5 years (7.76 words vs. 5.83 words, p=.022). Slope differed significantly between nonconverters and converters at all time points (baseline: 1.57 words gained per trial vs. 0.94 words gained per trial, p=.002; 1.5 years: 1.46 words/trial vs. 0.81 words per trial, p=.0008; 5 years: 1.35 words/trial vs. 0.44 words/trial, p=.00007). Initially healthy APOE e4 carriers who converted to MCI within 5 years showed a flatter learning slope at baseline that declined steadily over the study period relative to non-converters, suggesting early and progressive difficulties with consolidation years prior to MCI diagnosis. Group differences in initial recall (intercept) were not observed until the 5-year evaluation, suggesting that initial recall is relatively preserved until later in the disease course of MCI. Learning slope performance on the AVLT appears to be a useful marker of risk for MCI in APOE e4 carriers, who are already at high risk for cognitive decline.

DE VITO, A.N., CALAMIA, M., ROYE, S., POMES, A., CHEDVILLE, K., HENICAN, L., DANIELS, G.

Cognitive Variability is Related to Cognitive and Functional Status: Findings from the CIVA Study

Objective: To evaluate preliminary data from the Cognitive Intraindividual Variability in Aging CIVA study which aims to examine the utility of cognitive within-person variability (IIV) in distinguishing cognitively healthy (CH) older adults from those with mild cognitive impairment (MCI). Further, this study is the first to explicitly examine the relationship between IIV and functional status.

Methods: Participants were 10 individuals with MCI and 20 cognitive healthy older adults recruited from an ongoing funded study in Baton Rouge, LA (Age M=72.42, SD=7.90; 71% female). Individuals were diagnosed with MCI if they scored at least 1.5 standard deviations
below normative scores on the Repeatable Battery for the Assessment of Neuropsychological status (RBANS; Randolph, Tierney, Mohr, & Chase, 1998) and demonstrated a decline from premorbid ability on the Test of Premorbid Functioning (TOPF; Pearson Assessment, 2009). To assess IIV, participants were administered a computerized battery of tasks that runs on E-Prime software in one session. This battery was designed to measure memory (List-learning and Recognition Task), choice reaction time (CRT Task), and three aspects of EF (Miyake et al., 2000): updating (2-Back Task), set-switching (Number-Letter Switching), and inhibition (Antisaccade and Sustained Attention to Response (SART; Jackson & Balota, 2012) No-Go Trials) performance. Intraindividual standard deviations (ISDs) which represent an individual’s standard deviations in performance across trials on a given task, were calculated for each participant in every task. Trial scores in which performance was 3 SDs above or below the mean were excluded and individual mean imputation was used to replace these values. Binary logistic regression that included demographic variables (i.e., age, gender, and education [M=15.55, SD=2.38]) and ISDs from each task was used to determine which tasks were successful in distinguishing CH and MCI individuals. Pearson’s correlations were used to determine whether relationships existed between IIV and functional status (Instrumental Activities of Daily Living; Lawton & Brody, 1969). A multiple regression analysis that included demographic variables and ISDs was conducted to determine whether IIV predicts functional status.

Results: Individuals with higher IIV on CRT and Number-Letter Switching Tasks were more likely to be diagnosed with MCI (i.e., p’s < .05). There was no difference in likelihood of being diagnosed with MCI on the other tasks (i.e., p’s > .05). Higher IIV on the Number-Letter Switching Task was associated with higher levels of functional impairment (i.e., p < .01).

Conclusions: These preliminary findings suggest that IIV may be a quick and useful tool in distinguishing those with MCI from cognitively healthy individuals. Further, IIV on at least one task was associated with functional status.

ICATION, B., OBOLSKY, M., LAPITAN, F., PAXTON, J.
The Relationship Between Trauma Exposure and Executive Functioning in Aging Populations

Problem: Research has shown that the broad effects of post-traumatic stress disorder (PTSD) on cognition worsen with age (Polak et al., 2012), older adults with PTSD have worse cognitive functioning in general than older adults without PTSD (Schuitevoerder et al., 2013), and worsening cognitive impairment can exacerbate PTSD symptoms in elderly populations (Yaffe et al., 2010). Other research has shown that some cognitive functions such as planning may be spared in PTSD (Vasterling et al., 1998; Lagarde et al., 2010). These studies were conducted with psychiatric populations seeking treatment for PTSD, but less is known about non-treatment-seeking individuals with trauma exposure. The purpose of this study was to investigate executive functioning (EF) abilities of individuals with a range of exposure to trauma. We chose to use an epidemiological population of adults over the age of 40 to compare the effects of trauma exposure among individuals who may be experiencing age-related declines in EF.

Subjects Used: Participants were 850 individuals between ages 18 to 85 from Nathan Kline Institute’s Rockland Sample (Nooner et al., 2012). Participants were excluded if they endorsed conditions associated with cognitive impairment (e.g., brain injury), or if they reported receiving treatment with psychotropic medications and presented with acute psychiatric symptoms.

Procedure: Participants were classified based on age: ages 40-49 (n = 114), ages 50-59 (n = 138), ages 60-69 (n = 122), and ages 70-85 (n = 98). Self-reported distress related to trauma exposure
was measured by the total score on the Trauma Symptom Checklist-40 (TSC-40). Full scale intelligence (FSIQ) was assessed with the Wechsler Abbreviated Scale of Intelligence. EF was assessed with the Delis-Kaplan Executive Functioning System Tower test.

Results: A one-way analysis of variance showed the four age groups did not differ significantly on the TSC-40 (p = .092) or on the age-corrected scaled score for the Tower test (p = .874). For the entire sample, total score on the TSC-40 was not correlated with age-corrected scaled score for the Tower test (p = .473) when controlling for FSIQ. However, when partial correlations controlling for FSIQ were performed for each age group, the ages 40-49 group showed a significant positive correlation between TSC-40 score and Tower score (r = .22, p < .05). In contrast, the ages 60-69 group showed a significant negative correlation between TSC-40 score and Tower score (r = -.22, p < .05). Correlations were similar when conducted with Tower raw scores (ages 40 – 49: r = .19, p < .05; ages 60-69: r = -.23, p < .05). No other significant relationships were found.

Conclusions: Results demonstrated that for adults ages 60-69, higher self-reported distress related to trauma was associated with worse performance on an executive test of spatial planning and rule-learning. Surprisingly, higher trauma-related distress was associated with better planning and rule-learning in adults ages 40-49. These results suggest that, although trauma-related distress does not differ significantly with age in this community sample, the relationship between self-reported trauma and executive planning and rule-learning abilities does vary with increasing age.

KATSCHKE, J.L., SOBER, J.D., WOODARD, J.L., NIELSON, K.A., SEIDENBERG, M., CARSON SMITH, J., DURGERIAN, S., STEPHEN, R.M.
Learning Slope of an Auditory Verbal Learning Test as an Index of Cognitive Decline in Older Adults

Multi-trial list learning tasks are often used to explore learning and recall processes in older adults in an effort to identify cognitive decline. Previous research is mixed as to whether memory deficits are due to difficulties in acquisition (gained access) or consolidation (lost access or “forgetting”) deficits (Woodard et al., 1999; Davis et al., 2003; Dunlosky & Salthouse, 1996; Moulin et al., 2004). Previous research has used the number of words learned across subsequent trials (i.e., learning slope) as a measure of memory performance. The current study used latent growth curve modeling and linear regression to investigate the relationship between learning slope (i.e., change in number of learned words across trials) and acquisition and consolidation of words on the Rey Auditory Verbal Learning Test (RAVLT) in older adults. Sixty-two participants (Mage = 72.1 years, SD = 4.6; 26% male) were administered the RAVLT at baseline, at 1.5 years, and at 5 years. At each time point, latent learning slope was calculated using words correctly recalled across Trials 1 through 5 in a latent growth curve model. This latent slope from each time point was then regressed onto the sum of words gained between adjacent learning trials (RAVLT Gained Access) and the sum of words forgotten between adjacent learning trials (RAVLT Lost Access). Baseline latent learning slope significantly predicted Lost Access scores at each time point (baseline p = .009, 1.5-year follow-up p = .026, 5-year follow-up p = .039), such that older adults with a steeper learning curve showed decreased lost access (forgetting). Learning slope did not significantly predict gained access scores at baseline and at 1.5 years (baseline p = .158, 1.5year follow-up p = .065) but did do so at 5 years (p = .017). Results indicate that learning slope is related to more to successful consolidation and less forgetting than to acquisition in cognitively healthy older adults. Within this relationship,
individuals who show flatter learning slopes have a greater forgetting deficit, such that their difficulties with recall are due to an inability to remember previous words rather than to acquire new ones. At 5-year follow-up, learning slope did significantly predict gained scores, but this relationship could be due to progressive cognitive decline that was observed among some participants who eventually developed mild cognitive impairment. Although all participants were cognitively healthy at baseline, subtle reductions in baseline learning slope were associated with greater concurrent and future consolidation deficits, which may signal early signs of pathological memory loss.

KOCH, C., ROBERTSON, S.
Reliability and Test Differences for the ImPACT: Implications for Concussion Testing Programs
Growing concern about sports-related concussions has prompted state legislatures to create laws dealing with concussion education and return-to-play criteria. It is now also common for youth football leagues to require baseline concussion testing for participation. The ImPACT is a widely used neuropsychological assessment for diagnosing concussion and determining return-to-play readiness. Since the ImPACT can be administered in groups using computers, it is an efficient tool for baseline testing teams. The CDC recommends annual baseline tests and neuropsychological baseline tests every two years. This study was conducted to determine the long-term relatability of ImPACT scores among young athletes. Youth sport participants (n=295) who completed ImPACT tests one year apart were included in the study. Ages ranged from nine to 14 with a mean of 11.49 (SD=.92). The majority (n=184) were males. Test-retest reliabilities for verbal memory, visual memory, and response time were statistically significant but weak, ranging between .32 and .45. The impulse subscore and index score had poor test-retest reliabilities (both r=.20). Visual-motor test-retest reliability was also significant but moderate (r=.69). Scores for both memory subtests and the index score did not change over time. However, there was significant improvement for the visual-motor (t(258)=9.55, p<.001, d=.59), response time (t(258)=4.51, p<.001, d=.28), and impulse (t(258)=3.44, p<.001, d=.21) subtests. These results indicate that the long-term test-retest reliability of the ImPACT is inadequate and that several subtests change over time. This combination of findings make comparisons from one season to the next problematic. Therefore, it is recommended that baseline ImPACT scores are obtained on an annual basis and perhaps at the start of each season, if an athlete participates in multiple sports.

JEAN, K., ROBINSON, T., GOGNIAT, M., STEPHEN MILLER, L.
The Differential Effects of Education on Functional Status Based on Genetic Risk
Objective: To investigate the buffering effect of education on the relation between CSF tau levels and functional status in individuals with varying levels of risk for developing dementia. Method: Participants included 1,210 middle- to older adults (M = 73.2 years; 44.5% female; 16.05 years of education) collected from the Alzheimer’s Disease Neuroimaging Initiative merge database. Using Hayes’ Process macro, a moderated moderation model controlling for age was utilized to determine the buffering effect of years of education on the relation between cerebrospinal fluid tau levels and functional status and determine whether this buffering effect was moderated by APOE4 status. We predicted that greater CSF tau levels would be related to greater functional disability as determined by the Clinical Dementia Rating (CDR) scale sum of boxes score, and that education would moderate this relationship. We also predicted that the
moderating effect of education would also be dependent on APOE allele status (no e4 allele, e4 heterozygote, and e4 homozygote). Results: There was a significant three-way interaction between CSF tau levels, education, and apoe4 status, F(2, 1197) = 3.47, p=.032; ?R^2 = .05. For low educated e4 homozygotes, the relation between CSF tau levels and CDR score was not significant (p=.22), whereas increased education in this group led to a stronger association between CSF tau and dementia status. This pattern was not present for individuals with one or no e4 allele, as they demonstrated a reduction in the magnitude of the relation between CSF tau levels and dementia status at higher levels of education.

Conclusion: This study demonstrates that education serves to buffer the relation between CSF tau levels and dementia status, however, this relation is dependent upon genetic risk level such that the buffering effect of increased education is not present in individuals with the highest level of genetic risk (i.e., e4 homozygotes). This suggests that while increased education plays an important role in reducing risk of dementia, CSF tau’s biological influence on dementia status remains highly influential in e4 homozygotes. Overall, this study suggests that for e4 homozygotes, increased education shows no buffering effect. Therefore, other interventions that can directly reduce CSF tau levels for individuals at the highest risk of developing dementia may need to be explored.

LING, B.C., MELCHIORRE, A., GRIFFIN, K., SENSENBAUGH, J., GOKCE, E., WARFIELD, J.
Culturally Sensitive Neuropsychological Assessment: Review of Literature and Recommendations
Statement of the Problem: Neuropsychological assessment commonly uses an assortment of neuropsychological tests that have been largely developed and validated within non-Hispanic White populations (Brickman, Cabo, & Manly, 2006). Importantly, many neuropsychological tests provide a biased view of neuropsychological functioning when used for culturally and linguistically diverse populations (Baird, Ford, & Podell, 2007; Davidson, 1992; Manly, Byrd, Touradjii, & Stern, 2004; Manly et al., 1999; Saez et al., 2014). In addition, many neuropsychologists do not feel adequately trained to assess culturally diverse populations (Echemendia, Harris, Congett, Diaz, & Puente, 1997). As the base of research on neuropsychological assessment across multiple cultures and languages continues to grow, a need for recommendations based on a systematic review of the literature has emerged.

Procedure: The literature on culturally sensitive neuropsychological assessment was systematically reviewed to consolidate the current literature that exists, and to develop recommendations for practicing culturally appropriate neuropsychological assessment. PsycInfo and Medline were searched using keyword searches. Inclusion criteria were based on the methods of previous studies.

Results: Preliminary results indicate that several factors may impact performance on neuropsychological assessment of culturally and linguistically diverse individuals. First, level of education and literacy were found to be a significant predictor of performance in both Latino/a/x and African American groups (Baird et al., 2007; Gasquoine, 2001; Manly et al., 1999; Manly et al., 2004). In addition, sociocultural factors in general accounted for a greater proportion of variance in nonverbal neuropsychological test performance than neurological factors in Hispanic participants (Saez et al., 2014). Next, several measures were found to produce inaccurate estimates of neuropsychological functioning. African American adults were found to have lower
scores on the Boston Naming task and the Wisconsin Card Sorting Task (Boone, Victor, Wen, Razani, & Ponton, 2007). In addition, the WISC-III was found to underestimate Verbal, Performance, and Full-scale IQ scores (Dolan, 1999). Finally, although clinicians often attempt to adjust their interpretations based on ethnic groups, these attempts may affect their clinical opinions in a way that bias test result interpretations (Sayegh & Knight, 2013).

Conclusions: Several recommendations emerged from the preliminary results of the literature review. Test selection was found to be particularly important when working with culturally and linguistically diverse groups. As such, attempts should be made to identify the most appropriate test versions and norms for the particular individual and situation (Judd et al., 2009). To this end, the client’s degree of acculturation, bilingualism or multilingualism, dialect, and preferred language should play a role in test selection, as multiple studies have shown these factors to drive biased results in culturally diverse populations (Baird et al., 2007; Boone et al., 2007; Davidson, 1992; Manly et al., 2004, 1999; Saez et al., 2014). In addition, conceptualizing neuropsychological functioning through specific models, such as Luria’s Information Processing Model, may help reduce bias in results (Davidson, 1992). Other recommendations related to specific test batteries and norms are discussed.

CZAPLEWSKI, J.M., LEWIS, D., JOHNSON, E.
A Normative Study on the Brief Neuropsychological Cognitive Examination on Individuals 90 and Over
The Brief Neuropsychological Cognitive Examination (BNCE; Tonkonogy, 1997) test was designed for use by psychologists and neuropsychologists as a preliminary clinical evaluation to assess executive functioning, visual gnosia, language, and memory. Much research has been completed using the BNCE; however, it has not gone under standardization for individuals 90 years of age and over. The development of normative data that are age sensitive to the target population is of importance. The present study aimed to establish normative data for individuals 90 years of age and over using the BNCE, a common clinical screening tool used to identify deficits in patients with primary psychiatric disorders, brain injuries, and neurological impairments.

LOZANO-RUIZ, Á., LEONARD, B., DAUGHERTY, J., PEREZ-GARCIA, M., PUENTE, A., IBANEZ-CASAS, I.
Cross-cultural Differences in Working Memory through the Digit Span Task of the EMBRACED Battery
Statement of the problem: Working memory is crucial in our daily life and it is necessary for any routine activity, as well as for reasoning or learning. Previous studies have shown that working memory may operate in different ways depending on cultural factors (Olazaran, Jacobs, & Stern, 1996; Lopez et al., 2016). Despite the doubtless importance of cultural factors, the number of instruments available to measure this neurocognitive process in different cultures and languages is very limited. The use of measures that are not culturally adapted can lead to false positive diagnosis for certain mental or neuropsychological disorders. The aim of the present study is to determine and clarify the possible cross-cultural differences in working memory between Hispanics, Non-Hispanics and Spaniards.
Participants: In the present study a total of 72 participants were included. Of them, 16 were Hispanics, 43 Non-Hispanics and 13 were Spaniards. This is a subsample of the broader EMBRACED project which intends to obtain normative data for a computerized
neuropsychological battery in several cultural groups. The intended full sample for this project includes a total of 240 healthy participants in each cultural group, with age ranging from 18 to 85 years, both males and females and with all educational levels.

Procedure: The EMBRACED battery includes a total of 16 neurocognitive tasks assessing 8 different domains. It includes a working memory task called the Digit Span task inspired in previous well-known working memory tasks. It consists of two subtasks (Forward and Backward), in which seven pairs of trials with increasing difficulty are presented auditorily in the iPad. The participants must repeat each trial orally in order to be recorded on the iPad. The total number of correct trials and longest correct series are recorded. Analysis of covariance and post-hoc pairwise comparisons were performed to compare the scores of the three cultural groups in the Digit Span task with a single overall measure including both Forward and Backward subtasks.

Results: For the total number of correct trials, we found significant differences between all pairwise comparisons except among Spaniards and Hispanics who performed the task in Spanish. When we compared the longest correct series, we found significant differences between non-Hispanics and Hispanics who took the task in Spanish and between non-Hispanics and Spaniards.

Conclusion: In summary, non-Hispanic subjects had a better working memory than Hispanics (who performed better when they took the task in English than in Spanish), finally followed by Spaniards, whose execution was the worst in all cases. These results points to the importance of various factors, mainly the culture, when assessing working memory, and the necessity of using culturally adapted instruments for the assessment of each target population to prevent diagnostic errors.

HORTON, A.M., REYNOLDS, C.R.

Age and education correlates of a short form executive functioning test

Statement of Problem: This poster assesses the relationship between a short-form of the Test of Verbal Conceptualization and Fluency (TVCF) a test of executive functioning, and age and education. The newly developed short form test of executive functioning has not been assessed for possible age and education effects. This poster examines if the subtests of the short form of executive functioning are correlated with age and education variables.

Subjects Used: 29 adult clinical patients referred by neurologists and psychiatrists for outpatient neuropsychological evaluations at a private practice office were used as subjects. The patients included 14 females, 26 Caucasians and 2 African-Americans. 27 patients were right-handed. Diagnoses include Stroke-15, Traumatic Brain Injury-7, Alzheimer’s disease -3, Multiple Sclerosis-2, Parkinson’s disease-1 and Brain Tumor-1. Ages ranged from 20-74 (Mean-52.9, Standard Deviation-14.4) and education ranged from 10-20 years (Mean-15.8, Standard Deviation-7.7).

Procedure: All of the adult patients were administered full neuropsychological batteries that included the TVCF. All subjects had signed informed consent documents and passed performance validity testing. The short-form of executive functioning utilizes a card sorting format to assess executive functioning and the proposed short-form which uses half of the number of cards (58) used with the TVCF long-form (116) and may be a more time efficient means of assessing executive functioning. The subject learns to sort a deck of cards by the principles of color, topic (animals, transportation, food and clothing) and number of words on a card in response to verbal feedback. Scores included Number Correct (NC), Perseveration Errors
(PE) and Number of Categories (CN). For the short form subtest means and standard deviations were as follows NC-Mean-50.6, Standard Deviation-7.7, PEMean-46.3, Standard Deviation-6.7 and NC-Mean-3.8, Standard Deviation-2.3. (NC and PE are t-scores computed after raw scores were doubled and NC is number of categories doubled). Correlations were calculated between the three short form of executive functioning subtests and age and education variables. Results: CN, PE and NC short form subtest correlations with age (.07, -.25, -.21, respectively) were not statistically significant at the P<.05 level. Also CN, PE and NC short form subtest correlations with education (.18, -.09, .13, respectively) were not statistically significant at the P<.05 level.

Conclusions: The newly developed short form of executive functioning subtests appears to be relatively independent of the effects of age and education variables. The CN, PE and NC scores appear to be measuring something different than age and education. These results will help to facilitate the clinical interpretation of the newly developed short-form test of executive functioning. These results suggested a more time efficient short form of executive functioning may be feasible. Further research on the use of the short form of executive functioning to assess executive functioning appears warranted.

VARELA, J., ORD, A., JENKS, J.
Technology Use and Neurocognitive Functioning: A Systematic Review of Literature
Statement of the Problem: Mobile technologies are now involved in almost every aspect of daily life. Rapid expansion of mainstream use of portable devices (such as smartphones and tablets) in the recent years has generated a growing interest in the field of psychology regarding the impact of technology use on human functioning and cognition. Research suggests links between mobile technology use and various aspects of neurocognitive functioning, such as memory, impulsivity, attention and even academic performance among children, adolescents, and young adults.

Procedure: Twenty recently published studies that examine technology use and neuropsychological functioning have been included in this systematic review of literature, and their findings will be summarized and analyzed in this presentation. This systematic review of published literature intends to examine what this growing body of research suggests regarding the impact of technology use on various aspects of neurocognitive functioning.

Results: Recent research indicates that inundation of mobile technologies may have long-term impacts on various aspects of neurocognitive functioning, including working memory, long-term memory, and sustained attention. Further, studies suggest that increased use of technology devices can result in an increased susceptibility to ambient distractions. Additionally, technology use may increase the tendency to desire immediate rewards and decrease one’s tendency to delay gratification as well as increase impulsivity. Finally, mobile technologies also perform a number of tasks for people on a daily basis, from calendar alerts and reminders to enabling access to any form of information at any time, raising the concern that mobile technology may be potentially damaging in how it is subsidizing and supplanting information processing. Research shows that when people expect to have access to information at any time, memory recall may also be diminished.

Conclusions: The existing body of research examining links between technology and cognitive functioning is limited but growing. Several associations have been found between technology use and various aspects of neuropsychological functioning (including sustained and divided attention, working memory, long-term memory, and impulsivity). However, it is of note that
research published to date is largely correlational and data supporting causal relationships are sparse. Nevertheless, the existing findings raise important implications and questions that should not be ignored in clinical care and that can be utilized to improve patient care and outcomes. Clinical implications of the findings will be further discussed in this presentation.

PAKRAY, H., CACCAPPOLO, E.
Case Study of AD with Tactile Hallucinations and Somatic Delusions as Initial Symptoms

Background: Psychotic symptoms in Alzheimer’s disease (AD) are most prevalent within the moderate to severe stages of disease and are thought to be associated with a more rapid progression of cognitive decline (i.e. AD + Psychosis; AD+P). The presence of tactile hallucinations and delusional parasitosis, particularly as primary presenting symptoms, is relatively uncommon in AD and there is preliminary evidence to suggest that individuals with such a presentation are at greater risk of early mortality.

Case: A 66-year-old African American female with a lifelong history of generalized anxiety but no other psychiatric symptoms presented with 1-2 years of intermittent psychosis and cognitive decline. The onset of cognitive symptoms coincided with the onset of psychotic symptoms. The patient reported persecutory and somatic delusions, active suicidal ideation, and multimodal hallucinations (i.e. visual and tactile). The patient’s hallucinations, although multimodal, were primarily tactile in nature and associated sensations were localized within the oral cavity. Despite being treated with risperidone and paroxetine, these psychotic symptoms persisted for at least 8 months and were accompanied by symptoms of progressive memory decline. Results of neuropsychological evaluation revealed a pattern of diffuse cognitive impairment suggestive of AD, with notable difficulties in semantic retrieval and the encoding of novel information. Imaging was notable for volume loss and CSF indicated elevated tau.

Conclusion: Although relatively uncommon, tactile hallucinations associated with somatic delusions of parasitosis can present as an initial symptom in patients with AD+P. Increased awareness and understanding of atypical clinical presentations such as sudden onset tactile hallucinations and cognitive decline can aid with improved diagnostic accuracy in AD and other dementing pathologies, as well as providing information regarding the pathophysiology of tactile hallucinations.

Cognitive Reserve, Processing Speed, and Reasoning Contribution to the Digital Maze Test (dMaze)

Statement of Problem: Traditional maze tests are used to assess executive functions. An experimental digital version of the traditional maze test (dMaze) has been designed but not formally examined to assess theoretical associations to executive functioning. Hypothesis: Subtle process approach measurements including variance seen in 1) pen stroke count and 2) total completion time will be explained by a) cerebral cognitive reserve, b) processing speed, and c) reasoning. As maze decision difficulty increased, we expected increased contribution of processing speed and abstract reasoning on pen stroke count and total completion time.

Participants: This study is part of two larger federally funded investigations. Sixty nondemented older adults [age: 68.00(5.70); education: 15.27(2.67); 50% female] completed comprehensive neuropsychological testing with dMaze.
Procedure: Participants completed dMaze with a pen that captures behavior 82 times per second. Data were downloaded and confirmed by a reliable/trained rater and double entered. Hierarchical regression controlling for age and cognitive reserve (reading ability measured by Wide Range Achievement Test) in block one, a composite of processing speed (Digit Symbol Coding total correct, Stroop Word total correct, Trails A total time) in block 2, and a composite of abstract reasoning (Tower Test total achievement, Judgment of Line Orientation total score) in block 3 examined differences for two outcome variables: 1) number of strokes and 2) total time to completion. Variables were examined by dMaze test decision-making difficulty level (easy, intermediate, and advanced).

Results: Stroke count: Age, cognitive reserve and processing speed accounted for 23.2% of the variance demonstrated in the easy maze, and 30.6% of the variance in the intermediate maze (both p<.05). Abstract reasoning accounted for an additional 11% of the variance in the intermediate condition alone (p<.001). Age and cognitive reserve accounted for 14% of the variance in the advanced maze (p<.05), and there was a trend for processing speed explaining an additional 5.8% of the variance in the advanced maze (p=.053). Total Completion Time: Age, cognitive reserve, and processing speed accounted for 47.4% of the variance in the easy maze, 37.1% of the variance in the intermediate maze, and 35.4% of the variance in the advanced maze (all p<.05). Abstract reasoning did not improve any of the models above and beyond cognitive reserve and processing speed (all p>.05).

Conclusion: In our sample of non-demented older adults, cognitive reserve and processing speed were foundational elements that explained variance in total pen count and total completion time for easy and intermediate digital mazes. Abstract reasoning accounted for an additional 12% of the variance explained in number of strokes for the intermediate dMaze alone. Additional research needs to explore the advanced dMaze condition to determine potential cognitive associates of advanced dMaze performance. Funded by: NSF (10404333), NIHR01NR01418.

XIA, Y., YANG, R., MERRITT, V.C., ARAUJO, C.E., JAK, A.
Distinguishing Amnestic MCI Subtypes in Older Adults via Screening versus Expanded Memory Tests

Although the Montreal Cognitive Assessment (MoCA) has been validated as a screening tool for Mild Cognitive Impairment (MCI), the diagnostic accuracy of MoCA has been variable and the concordance between MoCA and conventional neuropsychological measures has been inconsistent. Specifically, MoCA has shown high sensitivity and low specificity with memory deficits. This study aims to further examine MoCA’s accuracy in distinguishing single versus multi-domain MCI subtypes.

52 non-demented adults, ages 55-80 (M=69.00, SD=6.37), completed a comprehensive neuropsychological assessment as part of a larger intervention study. Participants were required to score 0 or 0.5 on the Clinical Dementia Rating and MoCA total scores ranged from 18-30 (M=25.62, SD=2.94). Memory was measured via the Hopkins Verbal Learning Test (HVLT). Presence or absence of MCI (normal: n= 21; single-amnestic: n = 17; multi ami nestic: n = 9) was determined via established neuropsychological criteria (Jak et al., 2009). Given the low sample size, individuals with non-amnestic MCI (N=6) were excluded from the analysis of this project. Using a cutoff score of 26, ROC curve analysis showed that MoCA had only moderate sensitivity (0.615) and a high false positive rate (0.286) to identify MCI. One-way ANOVA and subsequent Tukey HSD post-hoc tests revealed that the MoCA total score (p < 0.001) and the MoCA delayed recall sub-score (p = 0.037) successfully differentiated between the multi-domain
amnestic MCI and the cognitively normal groups but did not successfully differentiate between the cognitively normal and single-domain amnestic MCI groups (total score: p = 0.938; delayed recall sub-score: p = 0.960). In contrast, one-way ANOVA showed that HVLT Total Recall did significantly differentiate both the single- and multi-domain amnestic MCI groups from the cognitively normal group (single-domain: p < 0.001, multidomain: p < 0.001), though did not distinguish between the two amnestic MCI groups.

While the MoCA has utility as a screening measure and can distinguish more advanced, multi-domain amnestic MCI from those who are cognitively normal, traditional neuropsychological memory measures are better able to distinguish the nuanced differences between those who are cognitively normal versus those with both single and multi-domain amnestic MCI. MoCA has more limited accuracy in single domain or early stage MCI and its use should not supplant the use of more comprehensive neuropsychological testing.

WISE, S.E.
Executive Functioning in Adults with Childhood Diagnosed ADHD: Patterns of Persistence and Remission
Attention-Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder that can lead to impairments in academic, social, and psychological functioning. While often characterized as a childhood disorder, many children with ADHD continue to have symptoms as adults. Research on the neuropsychological profiles of adults with ADHD and the role of executive functioning in symptom persistence have produced inconsistent results. The current study adds to this literature by examining specific executive functioning deficits in middle-aged adult males with a childhood-diagnosis of ADHD (i.e., probands) as compared to controls without any history of the disorder. Within this group of probands, about half reported current symptoms of ADHD (i.e., persisters). These persisters were then compared to those who reported no current ADHD symptoms (i.e., remitters) on these same tests of executive functioning. Results and implications for current theoretical models of adult ADHD and symptom remission will be discussed.

DIXON, J.S., MATHER, M.A., SANTORELLI, G.D., ORLOVSKY, I., BROGGI, M.J., READY, R.E.
Subjective Memory Complaints in Older Adults: Associations with Affect and Cognitive Outcomes
Subjective Memory Complaints (SMC) are common in older adults and are associated with emotional well-being outcomes - such as negative affect (NA) – more than objective memory scores. Less is known about the association between positive affect (PA) and SMC. PA is important to consider because it is a psychological resource. The primary aim of this study is to determine associations between SMC and indicators of emotional well-being that include positive, as well as negative subjective outcomes. Whereas SMC is not usually associated with memory performance, it is possible that the association between SMC and emotional well-being could be moderated by neuropsychological variables, such as objective memory or executive function scores. That is, for persons with stronger neuropsychological function, the link between SMC and subjective outcomes may be weaker than for persons with poorer function; we explore this hypothesis. Data were derived from two datasets of cognitively healthy older adults. In study 1, participants (N = 32, M age = 71.3, SD = 7.9, 72 % female) provided self-report data on mental and physical health items, the Positive and Negative Affect Schedule – Expanded
(PANAS-X), the Affective Experience Questionnaire (AEQ), the Toronto Alexithymia Scale (TAS-20), the Apathy Evaluation Scale (AES), and the Center of Epidemiological Studies Depression Scale (CES-D). Neuropsychological measures were WMS-IV Logical Memory Delayed Recall (LM), WMS-IV Visual Reproduction Delayed Recall (VR), DKEFS Trail Making Test (TMT), and D-KEFS Category Fluency. In study 2, participants (N = 46, M age = 66.6, SD = 4.6, 75 % female) provided self-report data on mental and physical health items, the PANAS-X, AES, TAS-20, Beck Depression Inventory (BDI-II), and Ten Item Personality Inventory (TIPI). Neuropsychological measures were LM, TMT, and D-KEFS Verbal Fluency. SMC was measured by a single item, “Do you have any problems with your memory that interferes with your day-to-day life?” in both studies. For study 1, t-tests indicated that older adults with SMC (n = 5) reported significantly worse mental health and physical health, higher NA, and lower PA than participants without SMC (n = 27). There were no significant differences on neuropsychological outcomes however there was a trend for older adults with SMC to perform worse on Category Fluency. For study 2, t-tests indicated that older adults with SMC (n = 10) reported significantly worse mental health and physical health, and more apathy, depressive symptoms, and neuroticism than older adults without SMC (n = 36). Older adults with SMC performed more slowly on Trails 4 than older adults without SMC; there were trends for older adults with SMC to perform more poorly on Verbal Fluency and LM.

Neuropsychological performance did not moderate associations between emotional well-being and SMC in either study. Thus, when a cognitively intact patient has subjective memory complaints, neuropsychologists should assess a patient’s emotional well-being, including apathy, depressive symptoms, and other indicators of negative affect. SMC may be associated with lower PA and executive dysfunction but these findings did not replicate across datasets; further investigation of these correlates of SMC in healthy older adults is warranted.


Using fNIRS to Investigate Motor Executive Control in Children with ADHD

Clinical symptoms of ADHD are often marked by impairments in executive control of motor systems, including excessive movement, difficulty learning and preparing motor skills, problems inhibiting inappropriate motor behaviours, and difficulties planning an appropriate response. However, less is understood in terms of how engagement of certain brain regions may differ between children with and without ADHD while performing motor and executive tasks of varying complexity. Such differences in neural processing may help better understand the motor and executive difficulties that are characteristic in ADHD.

In this study, we employed functional Near Infrared Spectroscopy (fNIRS) to examine oxygenated blood flow during completion of a computerized cognitive interference task (the Multi-Source Interference Task) and compared the magnitude of cerebral oxygenation in children diagnosed with ADHD (n = 8) and those without (n = 9). fNIRS is a non-invasive optical imaging technique that uses infrared light to index oxygenated hemoglobin during task performance, as an indirect measure of neural activity. Typically developing children and those with diagnosis of ADHD, ages 6-13 years (M = 10.11, SD = 1.94) were recruited for the study. Typically developing and ADHD groups were matched on age and intellectual ability. ADHD group status was confirmed using rigorous diagnostic procedures including a clinical interview (KSADS-5) and behavioral rating scales (Du Paul ADHD Rating Scale-5). Children who were taking stimulant medications underwent a washout period of at least 48 hours before completing
the study. Though we did not observe reliable group differences in behavioral performance on
the MSIT, neural activation during task performance was localized in non-overlapping areas of
the right prefrontal cortex between groups; control participants recruited from dorsolateral
prefrontal cortex whereas ADHD participants recruited from superior frontal gyrus.
These results indicate that children with ADHD may recruit different areas within the executive
attention network relative to children without ADHD in order to complete the same level of task
performance. This also highlights the utility of fNIRS in elucidating meaningful group
differences that may not emerge at the level of behavioural performance. These findings are
congruent with past studies and may also provide insight into the executive motor deficits found
in ADHD, which will be expanded on further in the poster as this relates to cognitive and
behavioural performance.

LEWIS, J.M., MACOUN, S.J., WATSON, R., SCHNEIDER, I., SHEEHAN, J.C.,
MACSWEEN, J.
A Comparison of Symptoms and Services in Autism Spectrum Disorder
Children with Autism Spectrum Disorder (ASD) experience a range of cognitive, behavioural,
and physical symptoms that affect their social function, communication, mental health, school
performance, and overall quality of life. The manifestations of ASD occur on a spectrum that
differs significantly between individuals and across development. ASD has been typically
associated with intensive support needs; however, given the range of severity of ASD and
increasing recognition of individuals on the higher end of the ASD spectrum the actual intensity
of services required varies. Regardless, systems often allocate scarce resources based on
categorical diagnoses rather than dimensional approaches that more accurately capture the
range/severity of individual symptom profiles. This is clinically relevant in that children with
ASD can significantly benefit from intervention yet the services allocated may not specifically
match children’s particular needs. This is especially the case for school-age children where
diagnostic assessments may have occurred earlier in time and where development may have
altered symptom profiles.
We surveyed 26 children, ranging in age from 6-12 years, who were enrolled in an intervention
study for ASD. All children were formally diagnosed with Autism Spectrum Disorder using best
practice standards and guidelines for ASD diagnosis, including administration of ADOS, ADI-R
and cognitive/adaptive assessments. ASD diagnoses and symptom profiles were confirmed at
study entry using the ADI-R and Gilliam Autism Rating Scale and children and their families
were surveyed prior to starting the intervention study.
Correlational analyses did not indicate any significant associations between symptom severity
and levels of services provided. Further, symptom elevations did not necessarily appear to match
the specific types of services provided. These results suggest that children with more severe
symptoms are not necessarily receiving more support within the school ages and/or they may not
be receiving services tailored to their particular needs.
Overall, results suggest that ASD services for school age children may not be adequately
meeting their specific needs, at least within the sample that was surveyed. We will discuss in
greater detail the specific types of services that are being provided for school-age children with
ASD and how adequately they appear to be addressing specific symptom profiles. Further
discussion will focus on use of a dimensional approach for matching children with ASD with the
appropriate services, based on their symptom profiles.
GUERRA, M., MARSHALL, S.J., FROMUTH, M.E.
Chronotype Morningness and Eveningness Predicted by Executive Functioning Dimensions

Statement of Problem: Chronotype studies have documented that there are individual differences in circadian rhythms and preferences for morning and evening activities. Morningness is the propensity to go to bed and rise early and perform better in the first hours of the day. On the other extreme, eveningness is the proclivity to have later bed and waking times, shorter sleep durations, and better performance in late afternoon and evening hours (Natale & Cicogna, 2002). Currently, there is limited research that examines the relationship between individuals’ chronotype and core dimensions of executive functioning, namely working memory and inhibition. Likewise, more clarification is needed that examines how chronotype links to academic achievement in college-aged students.

Previous research has documented that chronotype preference is related to academic performance and cognitive ability, but the reported directions of the relationships are different. For example, meta-analyses indicate that eveningness is negatively related with academic achievement (Tonetti, Natale, & Randler, 2015). However, eveningness is positively related to cognitive ability (Preckel, Lipnevich, Schneider, & Roberts, 2011). Moreover, eveningness, in comparison with morning-types, have been found to perform better in some areas of executive functioning such as working memory, processing speed, and shifting (e.g., Giampietro & Cavallera, 2007). However, eveningness is related to more difficulty with impulsivity, a central executive functioning skill (e.g., Kang et al., 2015).

To clarify previous research findings, there are two main hypotheses for the current study. First, to further investigate the mixed finding related to executive functioning, it is hypothesized that eveningness will be better predicted by EF working memory skills in comparison to EF inhibition. Limited studies have directly compared how, and to what extent, these two core executive functioning skills, individually and together, predict chronotype. Second, it is hypothesized that higher eveningness will be associated with lower academic achievement.

Methods and Results: To address how chronotype related to core neurocognitive EF processes, participants (N = 142), attending a public university in the southeast region of the US, were administered the Morningness-Eveningness Questionnaire (MEQ; Horne & Östberg, 1976). This self-report measure was designed to assess chronotype categories. For the current study, MEQ scores were analyzed as a continuous variable, an approach that has been validated previously. Scores ranged from morningness to eveningness; Natale & Cicogna, 2002). In addition, participants were administered the Adult Executive Functioning Inventory (ADEXI; Holst & Thorell, 2016) subscales, which assesses two core areas, working memory and inhibition. Results will present multiple regressions that clarify how morningness and eveningness scores were predicted by the two executive functioning subscales (i.e., working memory and inhibition). Correlations will also be presented exploring the relationship between self-reported grade point averages (high-school and college) and chronotype.

Concordance of Embedded Performance Validity and Symptom Validity Failures in Post-9/11 Veterans
Statement of the problem: Embedded performance validity tests (PVTs) are a meaningful and increasingly-utilized part of neuropsychological evaluations in both clinical and research contexts when considering the cognitive performance of U.S. military veteran populations. Similarly, the use of objective symptom validity tests (SVTs) such as the Neurobehavioral Symptom Inventory (NSI) Validity Index (NSI-10) has been an important development in our understanding of polytrauma clinical presentations, particularly in post-9/11 veterans. However, the relationship between failures on PVTs and SVTs have been incompletely explored in this population. The present study explores these concordance rates in a post-9/11 veteran sample, and also evaluates if clinical/diagnostic group membership (i.e., PTSD diagnosis, deployment-related mTBI screening) impact performance on a group of embedded PVTs and a SVT.

Subjects: One-hundred fourteen post-9/11 veterans (18.4% female, 81.6% male; age M=34.2, SD=1.2) who completed an optional, standardized neuropsychological evaluation as part of a larger VA-funded study between 2012 and 2017 that included at least 3 embedded PVTs and the NSI-10 were included in this cross-sectional study.

Procedure: Each participant completed a demographic interview, the Clinician-Administered PTSD Scale for DSM-IV (CAPS-IV), self-report inventories including the Neurobehavioral Symptom Inventory (NSI) and other common psychiatric symptom measures, the DVBIC Brief Traumatic Brain Injury Screen (BTBIS), and a brief neuropsychological evaluation that included at least 3 out of a total of 4 embedded PVTs extracted from the California Verbal Learning Test-Second Edition (CVLT-II), Continuous Performance Test-Second Edition (CPT-II), and Brief Visuospatial Memory Test-Revised (BVMT-R). Participants were classified into embedded PVT groups based on number of PVT failures, and concordance rates were calculated for multiple SVT cutoffs for the NSI-10 that are commonly utilized in the extant literature (i.e., 13, 19, and 21). Group membership for PTSD diagnosis and deployment-related mTBI screening were also evaluated with respect to pass/failure rates on the NSI-10 and embedded PVT classification.

Results: Embedded PVT pass/failure classification was significantly associated with NSI-10 pass/failure classification when utilizing cutoffs of 13 and 19, but not 21 in this post-9/11 veteran sample, such that those with no embedded PVT failures were less likely to fail the NSI-10 using these cutoffs, while 1 PVT failure or more increased the likelihood of NSI-10 failure. Both PTSD diagnosis and a positive screening for deployment-related mTBI were associated with greater NSI-10 failures at all cutoffs, while PVT failures were not predicted by either PTSD or mTBI.

Conclusions: Findings suggest that utilizing embedded PVTs can be quite useful in predicting SVT performance, although careful consideration must be given to how many embedded PVT failures should be allowed when characterizing passing/failure. Moreover, having clinical classification for PTSD and mTBI predict SVT, but not PVT failures suggests that SVTs and PVTs appear to be clinically dissociable in post-9/11 veterans. Implications and directions for future research and evidenced-based clinical practice will be discussed.

EKSTROM, L., SANCHEZ VARELA, V., LOCKWOOD, D., RYAN, M.
Performance on the D-KEFS in a Correctional Inpatient Psychiatric Setting

Background: Past research has identified a significant link between executive functioning deficits and criminal behavior (Ogilvie et al., 2011). Likewise, impairment in various aspects of executive functioning have been identified as a risk factor for recidivism (Ross and Hoaken, 2011). While past research has identified a high prevalence of neurocognitive impairment among
prisoners (Young et al., 1998; Martel, 1992; Yeudal, Fedora, & Fromm, 1977), few studies have specifically investigated executive functions in prison populations (Meijers et al., 2015), and research is lacking even more in looking at executive functioning performance among incarcerated individuals with mental illness. Having a better understanding of which aspects of executive functioning are most impaired in this unique population can lead to improvements in treatment within prisons which can lead to reductions in recidivism rates.

Objective: This purpose of this poster presentation is to provide preliminary normative data on subtests of the Delis-Kaplan Executive Function System (D-KEFS) for inpatient psychiatric adults who are incarcerated.

Method: Participants for this study are adult, mentally ill, English-speaking, incarcerated males currently housed within the Psychiatric Inpatient Program at the California Medical Facility. Participants are recruited through a routine clinical referral process as well as by random selection. Data have also been collected from existing databases containing previously tested patients admitted to Department of State Hospitals-Vacaville from January 2007 to January 2017. Preliminary results presented at the conference are based on an estimated 75 cases, and will include demographic, psychiatric, and criminogenic descriptive data on this sample, as well as performance data on the D-KEFS Trail Making Test, Verbal Fluency, and Color-Word Interference subtests. Clinical implications and future research directions will also be discussed.

Cultural Differences in Part B but not Part A of the EMBRACED Trail Making Test

Statement of the problem: Trail Making Tests (TMT) have been extensively used in neuropsychological assessment and are theorized to reflect a wide variety of cognitive processes including attention, visual search and scanning, sequencing and shifting, psychomotor speed, cognitive flexibility and ability to maintain two simultaneous sets of information. The relationship between the scores in these tasks and different demographic variables such as age, gender or level of education has been extensively investigated (see Sanchez-Cubillo et al., 2009 for a review). However, the effects of culture - generally defined - on this task have been scarcely explored. The present study aims at exploring the performance of three different cultural groups on a computerized version of the TMT.

Participants: A total of 63 healthy participants were evaluated using the whole EMBRACED battery. Of these, 16 were Hispanics, 28 Non-Hispanics and 19 were Spaniards. The present study uses a sub-sample of the normative sample that is being collected as part of the EMBRACED project.

Procedure: A computerized version of the classical TMT was used including two different parts. Part A requires the participant to draw a line with his/her finger on the iPad screen connecting numbers in ascending order. In part B, the participants switches between letters and numbers. The time taken to complete each part (A and B) in milliseconds is automatically recorded through the EMBRACED application. In this battery, the TMT is administered in the 6th position.

Results: A one-way analysis of variance was conducted to compare the reaction time in part A and part B of Hispanics, Non-Hispanics, and Spaniards. There were no statistically significant differences between the three cultural groups for part A. However, there was a statistically significant difference between the groups in part B (F=3.260, p=.045). Post-hoc tests revealed a significant difference between Hispanics and Non-Hispanics (p=.046).
Conclusion: Our overall results indicated that Hispanics took longer to complete part B of our TMT, which is related to cognitive flexibility and executive control, whereas culture did not exert any significant effect for part A, more related to visual search and motor speed. These cultural differences should be further explored using a representative sample to analyze the specific factors contributing to this pattern of differences. Nevertheless, these findings justify the existence of culturally-adapted norms as those included in the EMBRACED battery.

DE LA TORRE, G.G., DOVAL, S., GONZÁLEZ-TORRE, S., RAMALLO, M.A., GARCIA, M.

RBANS profile in severe mental disorders
Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) is a brief neuropsychological test, which has been used to detect cognitive disorder in degenerative and no degenerative neurological diseases. It was developed at first place, in order to identify and evaluate the abnormal cognitive impairment in dementias as well as to be used as a neuropsychological screening battery. In addition, it has been prove to be effective to detect cognitive impairment in schizophrenia and other psychiatric disorders.

Our objectives in this study were to evaluate the presence of neurocognitive symptoms in a sample of patients with different severe mental disorder (SMI) (Schizophrenia, Borderline Personality Disorder, Depression) and to test if RBANS could be helpful in detecting these symptoms. We also compared this group to healthy group and established cognitive profiles of performance for each disorder of the sample. We tested sensitivity and specificity in a sample of severe mental disorders including Schizophrenia, Borderline Personality Disorder and Major Depression (total n= 200).

A preliminary analysis of one-factor ANOVA showed that there are significant differences between controls and the 4 groups with different mental disorders. In addition, there is evidence that reveals differences between mental groups (Borderline Personality Disorder and Depression).

GOTRA, M.Y., KESHAVAN, M.S., SWEENEY, J.A., HILL, S.K.

Longitudinal Neuropsychological Trajectories in First Episode Schizophrenia
Objective. Recent efforts to improve diagnostic classification of psychotic disorders have used neuropsychological and physiological measures to identify distinct subgroups of psychosis. Indeed, based on cognitive and neuropsychological profiles, schizophrenia patients were heavily represented in the most impaired subgroup, while one third of schizophrenia patients were classified in the least impaired subgroup most similar to healthy controls. This suggests significant variability in cognitive and physiological functioning in schizophrenia. Understanding cognitive and physiological change over time may inform efforts to move away from a diagnostic system based on clinical phenomenology in favor of more biologically and cognitively based systems. Participants and Methods. This study used latent class growth analysis to examine unique trajectories of six neuropsychological domains in schizophrenia compared to cognitive change in healthy individuals. A sample of 192 first episode psychosis patients underwent four neuropsychological evaluations beginning prior to treatment with antipsychotic medication and again about 16-weeks, 6-months, and one-year post-treatment. A comparison sample of 211 matched healthy controls underwent neuropsychological evaluations at similar time points. Results. For attention, executive function, and visuospatial memory, 2class solutions provided the best fit and were characterized by trajectories of 1) average performance
that was stable over time and 2) impaired but stable performance over time. Healthy controls were typically in the least impaired trajectory (79.9%-91.5%), while schizophrenia patients were relatively equally distributed across the two trajectories. For verbal memory, a 2-class solution also provided the best fit for the data, however the two classes were characterized by trajectories of 1) average performance with significant improvement over time, and 2) impaired but stable verbal memory longitudinally. Healthy controls were equally distributed across the two trajectories (55.2% and 44.8%), while schizophrenia patients were predominantly characterized by the impaired trajectory (78.6%). For motor function, a 3-class solution provided the best fit and was characterized by trajectories of 1) average and stable motor function, 2) intermediate impairment with declining motor function, and 3) baseline impairment followed by improvement over time. Healthy controls were generally in the stable and least impaired trajectory (76.1%), while schizophrenia patients were more evenly distributed across the three trajectories (19.8%; 40.1%; 40.1%). For sensory perception, a 3-class solution indicated trajectories differing on level of sensory perception rather than the slope over time, with schizophrenia patients distributed evenly across the three trajectories (38%; 36.9%; 25.1%). Conclusions. About half of schizophrenia patients had longitudinal cognitive trajectories similar to healthy controls for most neuropsychological domains. These findings were consistent with considerable variability in cognitive ability among schizophrenia patients and highlight distinct cognitive subgroups that are relatively stable after initiation of antipsychotic medication treatment through one year post-treatment.

Mobile Ecological Momentary Assessment (mEMA) of Post-concussion symptoms and Recovery Outcomes

Sport-related concussion (SRC) is a heterogeneous injury that results in physical, cognitive, emotional, and sleep related symptoms. Symptom reporting is a universal component of comprehensive SRC assessment, used in conjunction with balance, cognitive, ocular and vestibular tools to guide treatment recommendations and return to play decisions. The current symptom assessment paradigm involves patients retrospectively recalling and rating symptom severity across a window of time (e.g., past 48 hours). However, retrospective symptom reporting has been reported to be unreliable, and fails to capture variation in symptoms related to situational demands, activity level, or time of day. Ecological momentary assessment (EMA), which provides “real time” monitoring of information, provides an alternative for assessing symptoms following SRC that considers the preceding factors. Therefore, the feasibility of this approach needs to be further established. The aims of the current study were to: 1) describe mobile EMA (mEMA), symptom reporting across recovery, time of day, and type of activities/environments; 2) use mEMA scores to predict clinical outcomes (i.e., neurocognitive, oculomotor, vestibular); and 3) compare mEMA to a traditional symptom report approach for predicting sub-acute clinical outcomes and recovery time following SRC.

We conducted a prospective, repeated measures study of 20 patients (n=12 males) aged 15.35+/-1.98 years, recruited within 72 hours of SRC. Patients attended routine clinic visits at which they completed retrospective symptom self-reports (i.e., Post-concussion Symptom Scale [PCSS]), neurocognitive testing (Immediate Post-Concussion Assessment and Cognitive Testing [ImPACT]), and vestibular/oculomotor screening (VOMS). The mEMA surveys were administered three times per day via an app downloaded to a personal smartphone. A series of
Linear mixed models revealed mEMA symptoms decreased across days (B=-0.37, 95%CI: -0.4, -0.3, p<.001), patients reported lower mEMA symptom scores in the morning (p<.001) compared to the afternoon and evening. Participants reported higher symptoms during vestibular compared to physical (1.4, 95%CI: 0.1, 2.6, p=.035) and sedentary (2.2, 95%CI: 0.9, 3.5, p=0.001) activities. Linear Regressions revealed that mEMA symptoms during the first week post-concussion were positively associated with VOMS scores (p=.001-.02). In addition, mEMA symptom scores (B=2.20, 95%CI: 0.38, 4.03, p=.021) were a better predictor of recovery time than PCSS scores at visit 1 (-0.15, 95%CI:-0.89, 0.59, p=.675) and visit 2 (0.50, 95%CI: -0.81, 1.81, p=.432), with affective symptoms being the most significant predictor (p<.001). For every one-point increase in mEMA symptom scores there was a concomitant increase in recovery time of 2.2 days.

The use of mEMA provides an effective approach for monitoring symptoms following SRC that overcomes barriers of traditional symptom report. In so doing, mEMA captures fluctuations in symptom report by time of day and activity type, while eliminating retrospective bias inherent to current self-report symptom scores. mEMA also better predicted recovery compared to PCSS scores during clinic visits, and revealed affective symptoms are linked to longer recovery. However, one caveat to consider when using mEMA is its potential to foster hyper-awareness of symptoms that could protract recovery. The symptom patterns identified in this study may help clinicians refine management strategies, academic accommodations, and targeted therapies based on environments or activities.

ANZALONE, C., BRIDGES, R., EASON, M., LEUDKE, J., DECKER, S.
Brain Activity Identifies Mathematics Learning Disabilities
The methodologies used to identify children with math learning disabilities (LDs) within federal and state guidelines have significant problems (Decker et. al 2012; Fletcher, et. al, 2007). Current methods, such as the IQ-Discrepancy Model, referred to as a “wait-to-fail” approach, identify children only after they have fallen far behind in a subject, which is too late. The alternative approach, Response to Intervention, which was designed to improve early identification, does not lead to improved outcomes (Balu et al., 2015). Although an RTI method enhances early intervention, failure to respond to an intervention does not provide sufficient diagnostic information to identify a disability. As such, the potential for additional and/or more reliable methods of LD identification exists and should thus be pursued by research. The current study proposes a novel and potentially more effective method for identifying math LD.

Participants for the study included school age children with and without math learning difficulties (N = 60), ages 7 to 12 years. Participants were administered the Woodcock Johnson Tests of Achievement third edition (WJ-III Ach) followed by quantitative electroencephalography (qEEG) data collection. QEEG recordings were collected for participants at rest (i.e. not during a task) while their eyes were closed, with each recording lasting three minutes. Standardized coherence values were calculated (using software that sources a normative database for its Z-score calculations) between Brodmann area (BA) 39 (left and right) and the rest of their respective hemispheres (i.e. BA 39 on the left to rest of left hemisphere, BA 39 on the right to rest of right hemisphere). Likewise, standardized coherence values between BA 40 in each hemisphere and the rest of their respective hemispheres were also calculated. Principle component analyses (PCA) were applied to coherence values across each frequency band and only components that passed the screen test and met assumptions (Bro & Smilde, 2014) were considered. PCA revealed that BAs implicated in quantity representation
(BA 40) and visual number perception (BA39) (Arsalidou & Taylor, 2011) were involved in components across various frequencies in both hemispheres. Six of these components were found to be significantly correlated with WJ-III Ach mathematics subtests. Regression analyses were used to test if each of these six components could predict participants’ performance on tests of math calculation, fluency, and/or applied problems. Results reveal that several of these components had significant predictive utility for participants’ math skills. Although this analysis was largely exploratory, it demonstrates promise for a new method of assessing children’s mathematics abilities and thus, math learning disabilities in young students. Because qEEG obtains measures directly from the brain, the interpretations of these results are largely objective, mitigating the potential for human error and potentially reducing the incidence of false positives and negatives in LD identification. Findings warrant continued research, yet suggest analyses of qEEG coherence have the potential to enhance current diagnostic procedures for identifying math LD in children – a pressing need in today’s society.

BOSTON, N.C., BENNETT, R., SOLOW, A., CIRILLO, N., TRAN, V.
Anxiety Severity and Associated Effects on Executive Functioning Performance
Objective: The purpose of this study was to investigate the association between the potential effects of anxiety severity on executive performance, within a cohort of older adults.

Participants and Methods: Data analyzed was derived from a de-identified database of older adults (age>=65) from the National Alzheimer’s Coordinating Center (NACC). The sample (N=989; 57.2% female; 89.6% Caucasian; Mage=80 years; SDage=10.7 years; MEd=15.9 years; SDEd=2.7 years) was sorted into three groups using the Neuropsychiatric Inventory Questionnaire (NPI-Q): 1) Mild Anxiety [N=443], 2) Moderate Anxiety [N=414], and 3) Severe Anxiety [N=132]. A one-way ANOVA was used to compare varying levels of anxiety severity and individuals’ performance on a measure of executive function (Trails B).

Results: The one-way ANOVA yielded a significant difference between groups F(2,986) = 11.311, p < .001. A Bonferroni adjusted post-hoc analysis further yielded a significant difference between mild levels of anxiety and severe levels of anxiety (M-Difference = -29.421, p<.001), and between moderate levels of anxiety and severe levels of anxiety (Mean Difference = -24.723, p<.001). These results further suggest severe levels of anxiety negatively impact one’s executive functioning ability, as evidenced by Trails-B performance. There was no significant difference between those with mild and moderate levels of anxiety (p = .821) and Trails-B performance.

Discussion: Anxiety is among one of the most universal and debilitating mental health disorders in older adults. Further complicating this issue, older adults are at a greater risk for developing cognitive impairment, with memory and complex attention being central indicators (Beaudreau & O’Hara, 2008). If a severe level of anxiety is present, our findings suggest a statistically significant difference in one’s performance on tasks of executive function. Yerkes-Dodson’s law suggests an observed symmetric relationship between arousal and performance. Taking that into consideration, since there was no significant difference in individuals’ performance between mild and moderate levels of anxiety, it would be interesting to compare those with mild anxiety to those without, for additional clarity. In sum, clinicians should practice a cautioned awareness when evaluating an examinee’s performance on measures of executive functioning if anxiety is present.

VANDEBUNTE, A.M., ROGERS, S.A.
The Effect of Anxiety on Basic Auditory Attention in Older Adults
Current literature tends to highlight a negative association between anxiety and cognition. However, older adults with elevated state anxiety may benefit from higher alertness and arousal in ways that stimulate attention. Research, for example, shows that states of panic are associated with increased amygdala activity and stimulation of the prefrontal cortex (PFC), which also mediates simple auditory attention. This study therefore examines the possibility of a positive relationship between state anxiety and basic auditory attention in older adults. A total of 95 older adults (72 women), with a mean age of 79 (SD = 9.80), completed a comprehensive battery of neuropsychological tests. Attention was assessed through WAIS-IV Digit Span, and state anxiety was evaluated through the BAI, with responses divided into Osman's (1997) factors (subjective, neurophysiological, autonomic, and panic). Participants who met diagnostic criteria for dementia were excluded. Overall state anxiety was not correlated with WAIS-IV Digit Span, but there was a significant positive association between the BAI Panic factor and Digit Span, p < .05, even when age was controlled via hierarchical regression analyses, p < .04. Individual bivariate correlations revealed a significant positive correlation between Digit Span and item 7 on the Panic factor (i.e., the sensation of one's heart pounding/racing), p < .01, even controlling for age, p < .01. Semi-partial correlations controlling for age also showed a significant relationship between the number of digits recalled forward (but not backward) and the panic symptoms of anxiety, p < .03, particularly those who endorsed greater heart pounding and racing, p < .01. Contrary to the perception that anxiety is predominantly deleterious to older adults, auditory attention appears to be positively correlated with the panic symptoms of anxiety, even when partialling out the effects of age. The particular panic symptom that seems most related is the sensation of one's heart racing. Moreover, panic symptoms seem positively correlated only with basic or pure simple auditory attention, rather than working memory. These findings suggest that certain physiological sensations may be a tool in heightening auditory attention. They also suggest that losses in attention should be monitored when anxiety is treated.

VANDEBUNTE, A.M., ROGERS, S.A.
Does Having Children Serve as a Protective Factor Against Cognitive Decline and Negative Affect?
Previous research has suggested that having an immediate family member as a caregiver can serve as a protective factor against cognitive decline and negative affect in older adults. Researchers have speculated this is possible due to family members being more present than other potential caregivers (e.g., aids or nurses). However, it is also possible that having children as support during later life and through the aging process can actually protect against cognitive decline. The purpose of the current study is to examine the relationship between number of children and both cognition and negative affect among those with mild or major neurocognitive disorders. A total of 353 adults (156 women, M age = 73.98 years, M education = 14.82 years) who met DSM-5 diagnostic criteria for either mild or major neurocognitive disorders participated in neuropsychological testing as part of outpatient neurology evaluations. They indicated the number of children they have on a questionnaire and completed a neuropsychological battery that included the WAIS-IV, WMS-IV, DKEFS, Trailmaking, BNT, COWAT, ROCF, HVLT-R and BVMT-R. Participants had an average of 2.43 (SD = 1.42) kids, with a range of none to eight. Bivariate correlations revealed significantly positive correlations between number of children and
measures of gross cognitive functioning, memory, semantic language functioning, and mood. Specifically, older neurology patients with a greater number of children experienced better scores on MoCA (p < .05), WMS-IV Logical Memory II (p < .05), HVLT-R Delayed Recall (p < .01), BVMT-R Total Recall (p < .05), and BNT (p < .01). They also endorsed significantly lower levels of state anxiety (p < .05) and state depression (p < .05).

These results suggest that the presence, and number, of children may afford some cognitive benefit for older adults with neurocognitive disorders. Those with a greater number of children experienced stronger scores on measures of gross cognitive functioning, memory, semantic language functioning, state depression, and state anxiety. This could be due to the support children provide as caretakers, as they may be aware of the needs of their parents better than other potential aids. It could also be that raising children serves as a protective factor, either due to the development of cognitive abilities it entails or the social support and hope for the future it affords. Future research should explore the specific mechanisms involved, such as whether the cognitive or affective elements mediate each other. These findings may also have implications for the care and treatment of those with neurocognitive disorders, both with and without children.

The Clinical Utility of Functional Near Infrared Spectroscopy in Children with ADHD

Pediatric ADHD has been considered a neural disorder of motor systems, which can manifest in problems with appropriate motor response selection, inhibition of inappropriate motor behaviors, and behavioral regulation of movements, all of which can impact goal-directed behaviors. With the increasing incidence rates of ADHD diagnoses in children, there has been a growing body of neurocognitive research attempting to identify objective biomarkers for ADHD. This includes exploring underlying neural substrates associated with ADHD using functional neuroimaging techniques. Conventionally employed functional neuroimaging methodologies (e.g., fMRI) are limited to highly controlled settings and computer-based task administration and thus much less is understood about neurophysiological differences between children with and without ADHD outside of these settings and the clinical utility of such differences.

In this exploratory study, we employed functional Near Infrared Spectroscopy (fNIRS) to examine cerebral oxygenation differences during simple and complex motor tasks, between children with ADHD (n = 9) and typically developing (TD) children (n = 9), matched on age and intellectual ability. To be included in the ADHD sample, children’s prior diagnosis of ADHD was confirmed through a comprehensive clinical interview (KSADS-5) and ADHD rating scales (Du Paul ADHD Rating Scale-5). Those who were taking ADHD stimulant medications were tested after a medication washout period of at least 48 hours.

Participants completed a set of a simple (Finger Tapping) and complex (Cortical Motor Exam; CMot) motor tasks, where the latter involved more executive control of motor behaviors required to successfully complete the task (e.g., conflict and go/no-go conditions). Consistent with prior research, on the simple motor task, we did not find any meaningful behavioral or neurophysiological group differences. In contrast, during more executively demanding motor tasks (CMot), neurophysiological differences were observed in the context of no behavioral group differences. Specifically, children with ADHD showed less activation in left dorsolateral prefrontal cortex relative to TD children during go/no-go conditions, with such group differences approaching significance during conflict conditions.
In keeping with previous findings, these results suggest that children with ADHD may engage less dorsolateral prefrontal cortex compared to those without ADHD when performing more cognitively demanding tasks. Given the absence of behavioral differences between groups during the same task, these results implicate the potential clinical utility of fNIRS in the classification process, with additional considerations to be discussed during the presentation.

RESCH, Z.J., SOBLE, J.R., PLISKIN, N.H.
Concordance of Performance and Symptom Validity in Patients with Electrical Injury
Objective: This cross-sectional study investigated the concordance between performance on objective performance validity tests (PVTs) and symptom over-reporting on the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) validity scales among patients with electrical injury (EI). In total, pass/fail concordance was examined across 10 common freestanding and embedded PVTs (i.e., Test of Memory Malingering, Victoria Symptom Validity Test, Word Memory Test, Dot Counting Test, Rey 15 Item Test, Reliable Digit Span, California Verbal Learning Test – Second Edition-Forced Choice Recognition, Wisconsin Card Sorting Test-Failures to Maintain Set, Brief Visuospatial Memory Test-Revised-Recognition Discrimination, Repeatable Battery for the Assessment of Neuropsychological Status-Effort Index) and the five MMPI-2-RF symptom validity scales (SVTs) that assesses for over-reporting (i.e., Fr, Fp-r, Fs, FBS-r, RBS).
Participants and Method: Participants were 52 consecutive adult patients with EI referred for comprehensive neuropsychological evaluation. The sample was predominately male (n=46; 89%) and Caucasian (n=46; 89%) with a mean age of 43.9 years (SD=9.9) and a mean education of 12.6 years (SD=1.5). Most patients (81%) were involved in litigation or disability claims related to their injury at the time of evaluation. Average time since injury for the sample was 27.3 months (SD=18.4). Patients were classified as valid/credible if they had =1 PVT failure, which is consistent with standard practice of using =2 PVT/SVT failures as indicative of probable invalidity (Larrabee, 2014).
Results: Using each PVT’s respective cut-score for task failure and the criteria of =2 PVT failures to identify invalid neuropsychological test performance as well as the established MMPI-2-RF validity scales elevation cutoffs (Ben-Porath, 2012), there was mixed findings regarding concordance between pass/failure rates on the PVTs and MMPI-2-RF SVTs. Specifically, of the 42 patients with EI who failed =1 PVT (i.e., valid neuropsychological performance), only 13 passed MMPI-2-RF SVTs (31%), whereas 29 (69%) exceeded the cutoff(s) for possible over-reporting on =1 MMPI-2-RF validity scales. Of the 10 patients with EI who failed PVTs, 1 (10%) patient passed MMPI-2-RF SVTs, whereas 9 (90%) were identified as possible over-reporting =1 MMPI-2-RF validity scales.
Conclusions: Overall, the results are indicative of good concordance between performance validity and symptom validity among patients with EI who demonstrated invalid performance. However, performance validity and symptom validity appear dissociable among patients with EI with valid neuropsychological performance. It is possible that credible patients with EI are exceeding the cutoffs for possible over-reporting on the MMPI-2-RF at an inflated rate secondary to endorsing symptoms that are genuine complaints in EI secondary to peripheral nervous system injury, but infrequently endorsed in other general medical populations.

BRIDGES, R., ANZALONE, C., EASON, M., LEUDKE, J., DECKER, S.
ADHD Diagnosis in University Settings: The Utility of Quantitative EEG Coherence
Research has indicated that best practice protocols are seldom observed when examining adult ADHD (Roy-Byrne et al., 1997), including during evaluations of college students (Green & Rabiner, 2012). Deviations from best practice assessment protocols illustrate the need for improved ADHD evaluations in post-secondary educational settings, where self-report measures are often used as the only evaluation measure. As a result of the insensitivities in self-report measures, individual motivations to pursue an ADHD diagnosis, and inability of assessment tools to detect symptom malingering, results from self-report behavioral rating scales should not be used in isolation (Dupaul et al., 2009).

Neural markers pose the potential of contributing to the identification of ADHD. Electroencephalogram (EEG) is a method of measuring electrical activity in the brain by use of electrodes placed on the scalp. Despite extensive literature employing EEG in adult populations with ADHD, previous research has not examined in isolation the subgroup of young adults that are enrolled in post-secondary education. This differentiation is critical considering distinctions between ADHD populations that attend college and those that do not, as behavioral differences may be evident in EEG presentations. The current study investigated the utility of EEG coherence parameters in the diagnosis of ADHD. Quantitative EEG (qEEG) analyses were performed in 35 college students with an ADHD diagnosis and 35 control students. Differences between groups were examined and the diagnostic significance of EEG coherence parameters was assessed by means of stepwise logistic regression analyses. The relation between inattentive and hyperactive/impulsive symptoms, as measured by the current symptom scale (CSS) and EEG coherence parameters, was also assessed. Analyses assessing group differences using individual electrode pairings detected increased interhemispheric frontal beta-wave coherence in individuals with ADHD. Together, alpha, beta, delta, and theta-wave principle components allowed for identification of individuals diagnosed with ADHD with a sensitivity of 80% and a specificity of 71.4%. Moreover, symptoms of inattention were significantly correlated with EEG coherence values within beta and delta bands, while symptoms of hyperactivity/impulsivity were significantly correlated with coherence values within beta and theta bands.

Findings warrant continued research, yet suggest qEEG coherence analyses may enhance current diagnostic procedures used for identifying ADHD in college populations. This research is important given the clinical application of EEG technology as well as the limited supporting evidence regarding electrophysiological presentations within this population. Research examining the qEEG underpinnings of both the syndrome itself and related symptoms in young adults adds to the understanding of ADHD’s neural presentation beyond youth, which is currently relatively limited. Further, no studies have examined EEG correlates in exclusively college populations. Moreover, college students represent a subgroup of adults that would likely benefit from objective assessment tools during evaluations, as measures for diagnosing ADHD that are not susceptible to symptom feigning are needed in this population due to straying from best practice protocols in university settings (i.e., reliance on self-report measures) and various motivations to malinger ADHD symptoms.

EILEEN NG, L.T., KEEZER, R., MICHAELS, M., SMITH, J., PYKKONEN, B.
A Systemic Review of the Neurocognitive Profile of Behavioral Variant Frontotemporal Dementia
Frontotemporal dementia (FTD) is a clinical pathology that is characterized by progressive impairment in behavior, language and or motor ability. FTD is responsible for 2.7% of the dementia cases in adults above aged 65, and 10.2% of the dementia cases in adults below the age
of 65 (Hogan et al., 2016). Historically, it has been an elusive neurodegenerative disease to identify. In an attempt to define the disorder, FTD has been classified into three subtypes (behavioral, language, and motor). This article will systematically review the literature of the behavioral variant subtype of Frontotemporal Dementia (bvFTD). This bvFTD is the most common form of FTD and is responsible for approximately half of all cases of this disease (Seeley et al., 2008), which is characterized by progressively impaired judgment, social comportment, behavioral inhibition, and personality changes. Currently, treatment is limited to mitigating the functional impact of the disease's progression. To improve this rehabilitative approach to treatment, it is crucial to have a composite of varying presentations of bvFTD across the lifespan. The current systematic review will present a neurocognitive profile of bvFTD and the likely relationship to functional status.

The behavioral variant frontotemporal dementia (bvFTD) is an early onset progressive dementing condition. This progressive impairment is characterized by changes in personality, behavior changes, possible cognitive changes, and functional declines (Silva et al., 2013). Current diagnostic criteria for bvFTD requires three out of the following six criteria: inhibition, apathy, loss of empathy, perseveration/compulsive behaviors, hyperorality, and a dysexecutive neuropsychological profile (Silva et al., 2013). Additionally, a probable diagnosis will need to meet the criteria of a functional disability and characteristic neuroimaging results (Silva et al., 2013). Although there are specific neurocognitive and behavioral impairments documented and described in bvFTD, no data exists that documents the neurocognitive profile of the disease. A review of the literature will show that while there have been neuroanatomical markers and behavioral descriptions used to identify bvFTD, there still is currently no well-established cognitive profile of the disorder, as evidenced on formal cognitive testing (Silva et al., 2013). This is concerning given that proper identification and the subsequent recommendations made to the patient and their family are dependent upon accurate diagnosis and description of bvFTD during the earliest stages of its presentation. At present, there is no study that compiles the different presentations of bvFTD in the literature. This paper aims to bridge the gap by documenting the neurocognitive profile of bvFTD as published in the scientific literature through a systemic review. The present review is based on a literature search through major databases including PsychINFO, PubMed, ScienceDirect, Medline, SPRINGER. Our review is conducted using the search term “Behavioral Variant Frontotemporal Dementia”, “Cognitive ability/impairment of Behavioral Variant Frontotemporal Dementia”, “Functional ability of Behavioral Variant Frontotemporal Dementia”, “Personality of Behavioral Variant Frontotemporal Dementia”, “Neuropsychology of Behavioral Variant Frontotemporal Dementia”, “Neurocognitive profile of Frontotemporal dementia”, “Behavioral Variant Frontotemporal Dementia”. Reviewing the literature of the cognitive features of bvFTD will aid in clearly identifying a coherent cognitive profile and course that the diagnostic and intervention communities can utilize in a clinical setting.

COTHCHRAN, T., MARTIN, E., BRENNAN, M., SCIMECA, L., VAN HORN, B., POLLACK, M., HELD, P.

Symptom Validity and Treatment Outcome among Veterans with PTSD

Statement of Problem. Over-reporting of symptoms may obscure results from effectiveness studies involving veterans with posttraumatic stress disorder (PTSD). An embedded symptom validity index (Vanderploeg et al., 2014) was developed for the Neurobehavioral Symptom Inventory (NSI), which includes items infrequently endorsed by veterans with traumatic brain
injury, as well as items with strong correlations with neurologically implausible symptoms. It has been used successfully with veterans with traumatic brain injury, but its relationship with PTSD treatment outcome has not been investigated. This study hypothesized that pre-treatment over-reporting of symptoms would be associated with higher levels of distress on the PTSD Checklist (PCL) following treatment.

Participants. Data were examined from 322 veterans (mean age = 40.17 years; SD = 0.50, range: 24-70; 68% male; 69% white; median education = 14 years) enrolled in a 3-week intensive PTSD treatment program through the Road Home Program. The majority served in the US Army (64%), after September 11th, 2001 (91%), and were deployed to foreign wars (83%). Ninety-three percent (n = 298) of the veterans completed the program, consisting of group and individual cognitive processing therapy, mindfulness training, and other programming.

Procedure. Veterans completed the NSI and PCL at intake and post-treatment. Baseline NSI validity scores were calculated for each veteran. Hierarchical multiple regression was used to test whether baseline NSI validity scores predict post-treatment PCL scores after controlling for age, education, gender, and ethnicity. Post hoc independent t-test analyses compared mean PCL scores among groups classified according to published criteria for the NSI validity scores (Bodapati et al., 2018). Each NSI validity score was classified as “Unlikely,” “Possible,” or “Probable” over-reporting.

Results. The NSI validity scale demonstrated good reliability (a = 0.846). Results from multiply imputed (m = 35) hierarchical multiple regressions indicated that baseline NSI validity scores were significantly associated with post-treatment total PCL scores after controlling for age, education, gender, and ethnicity (R2 = 0.083, F [9, 312] = 3.138, p < 0.01). These scores significantly predicted PCL scores (B = 0.661, p < 0.001) and accounted for an average of 6% additional variance. Post hoc analyses revealed significant differences in pooled mean PCL scores between groups based on NSI validity classification criteria (i.e., “Unlikely” (n = 262 [81%]; mean = 37.22 “Possible” (n = 40 [12%]; mean = 42.95), and “Probable” (n = 20 [6%]; mean = 52.43). The strongest difference was between “Unlikely” and “Probable” (t = -3.45, p = 0.001). Mean differences between “Unlikely” versus “Possible” and “Possible” versus “Probable” were marginally significant (t = -1.73, p = 0.08 and t = -1.75, p = 0.08, respectively).

Conclusion. This is the first study to identify a significant relationship between over-reporting on the NSI and PTSD treatment outcome in veterans. Pre-treatment NSI validity scores were a significant predictor of post-treatment PCL scores and could be useful in treatment planning, despite only accounting for a relatively small amount of the variance. Future research should determine additional demographic and clinical characteristics associated with over-reporting by veterans and their effect on recovery from PTSD.

MUSGRAVE, H., GILREATH, C.
A Case of Suspected Posterior Cortical Atrophy; Seeing the Tree in the Forest
Posterior Cortical Atrophy is a progressive, neurodegenerative disease that presents with unique neuropsychological symptoms. Age of onset is generally earlier than other progressive dementias. Underlying pathology is not consistent over cases. Patients can be perceived as having mood disorders and anxiety. Often this disorder is misdiagnosed in the early stages; resulting in unnecessary ophthalmological procedures and can misidentify patients as malingers (Crutch, et al, 2012). Patients tend to present with visuospatial and visuo-perceptual impairments. Neuropsychological work-up can reveal a Gerstmann’s syndrome (agraphia, aacalculia, finger agnosia, left/right disorientation, and finger agnosia) as well as a Balint’s
syndrome (oculomotor apraxia, optic ataxia, environmental agnosia, and simultanagnosia). The case presented involves a 63-year old man who had complained for eight years of various visual difficulties. He has undergone multiple eye surgeries. Early on in the course, a neurosurgeon documented both possible limb apraxia and a hypothesis of conversion disorder that was carried forward throughout his lengthy medical record. Approximately eight years later, he was seen on an inpatient floor following a motor vehicle accident in which he had side-swiped multiple vehicles. He was noted to have left hemiplegia on the scene and deteriorated quickly. He was intubated and given tPA for a suspected brainstem stroke. He was referred for neuropsychological testing by the inpatient team and a thorough history was obtained. Neuroimaging revealed atrophy in the parietal and occipital lobes bilaterally. Interview with the patient and his wife brought forth reports of difficulty with ambient light, difficulty managing the finances, not “seeing” things such as food on his shirt, and no longer being able to read books and magazines. Neuropsychological testing identified symptoms consistent with Balint’s syndrome as well as Gerstmann’s syndrome. The patient had noted strengths in verbal skills and impairment with perceptual reasoning skills. He had significant impairment in processing speed, reading hand-written notes, spelling, writing, and arithmetic. He had impairment with visual learning and recall as well as copying both simple and complex figures. Results of the neuropsychological evaluation enhanced his healthcare team’s ability to interact with the patient through both education and specific recommendations.

JUAN, R., SAEZ, B., CANTU, H., CUNNINGHAM, R., JOHNSON, R., AGUERREVERE, L.E.

Frontal Lobe Electrical Brain Activity and Effort during Cognitive Tasks

Quantitative Electroencephalography (QEEG) is a brain mapping technique useful in detecting electrical brain activity and helps in determining brain functioning. Limited studies have investigated EEG patterns of mental effort during cognitive tasks. One study identified a positive correlation between mental effort and beta power during attentional tasks (Howells, Stein, & Russell, 2010). The present study investigated electrical brain activity as measured by PK frequency on frontal brain areas between individuals giving poor mental effort from individuals giving full mental effort. A total of thirty-one (Mage = 23.68, SD = 5.21) upper-level college students from a Southwestern University underwent QEEG recording using the International 10-20 system at the F3 and F4 locations while simultaneously being presented with the Rey-15 stimuli. The Rey-15 is one of the most common measures used to detect poor effort. Participants participated in one of two randomized groups: one group was asked to give poor effort (M = 14), while the second group was asked to give full effort (M = 17). We recorded and measured Beta Peak Frequency activity for each participant. NeuroGuide Software was used to analyze data. Preliminary results demonstrated a significant difference in scores for the full effort group (M = 13.88, SD = 0.21) and poor effort group (M = 4.50, SD = 2.28) on the Rey-15; t (29) = -13.04, p = .001. A significant difference was found in F4-F3 Beta PK Frequency asymmetry for the full effort group (M = .21, SD = 0.37) and poor effort group (M = -.32, SD = 0.73); t (29) = -2.63, p = .05, indicating that groups differed in the asymmetry scores at the frontal areas for the Rey-15 task. Full effort had higher PK frequency on F4 (M = 18.11, SD = 0.77), compared to F3 (M = 17.89, SD = 0.82), while poor effort had higher PK frequency on F3 (M = 18.05, SD = 0.80), compared to F4 (M = 17.73, SD = 0.70). The results suggest that poor effort could be represented by asymmetry on PK Frequency for Beta on the frontal lobe. Therefore, QEEG indicators can be used to identify poor mental effort from full mental effort on
cognitive tasks. QEEG could provide helpful physiological information in determining whether patient errors are or are not typical for their symptomatic complaints. However, much more research is needed to determine the effort related to the sensitivity and specificity of this technique.

Poster Session III

BUENO, A.
Sleep Deprivation and Hyperalgesia in College Students
Sleep deprivation is quite common and often associated with adverse negative effects like cognitive impairments and emotional disturbances. Recently, research on sleep deprivation has discovered a new phenomenon called hyperalgesia. Hyperalgesia is when a person becomes more sensitive to pain. Past research has shown that healthy participants have become more sensitive to pain after one night of total sleep deprivation (Schuh-Hofer, et al., 2013). The purpose of this study was to look at the relationship between sleep deprivation and hyperalgesia in college students. A total of ninety-four college students attending a university in southern California participated in our study that also examined other factors related to sleep. Participants completed the Profile of Chronic pain, a twenty-five item assessment that includes subscales that measure pain severity, interference, and emotional burden with focus being put on the severity subscale. Sleep deprivation was measured through the use of sleep diaries and the apple watch and Fitbit apps. For this study, sleep deprivation was measured over a time span of one week with two in-person sessions. Sleep diaries, Fitbit app, and the Apple watch were programmed to measure sleep deprivation in the first session while data was collected in the second session. This was also followed by a testing session that included the Profile of Chronic Pain. It was hypothesized that participants who reported being sleep deprived would have higher scores on the pain severity compared to those that didn’t report that they were sleep deprived. It was also hypothesized that there would be a strong correlation between the Fitbit and sleep diary. Linear regression was used to assess the amount to which sleep deprivation predicted hyperalgesia.

TURKELSON, L.G., MAN, Q., NUNEZ, M.
A Differential Study on Cognitive Predictors of Math Computation, Math Concepts, and Math Fluency
Until recently, research in the field of learning disabilities has focused primarily on reading. Several cognitive constructs have been identified as contributing strongly to reading abilities and several models exist for how these constructs relate to reading-based skills. However, math learning disabilities (dyscalculia) are poorly understood by comparison. While researchers have suggested possible cognitive constructs that may be involved, the results are not consistent across studies. For example, several researchers have reported working memory and executive functioning deficits in children with dyscalculia; however, some children seem to show no executive functioning deficits, but are impaired on visual spatial tasks (Swanson & Jerman, 2006). Some have also suggested a double-deficit hypothesis, where one subgroup exhibits both impaired executive functioning and impaired spatial abilities (Osmon, Smerz, Braun, & Plambeck, 2006). The current study sought to look at the ability of several cognitive constructs to predict performance on different types of math tasks: math computation, math concepts and applications, and math fluency. Our sample included 29 children (ages 7-16, Female = 10) referred for assessment at a local learning disability clinic. All subjects were administered a
standard battery of neuropsychological tests including the WISC-V and an achievement test (KTEA-3). Our results indicate that Math Concepts and Application was significantly correlated with several constructs; however, only Visual Puzzles significantly predicted performance in Math Concepts and Applications ($r^2 = .69$, $n = 27$, $p = .002$). Math Fluency was also significantly correlated with several constructs, but only Symbol Search significantly predicted performance on math fluency ($r^2 = .59$, $n = 27$, $p = .004$). There were no significant correlations between any of the measured cognitive proficiencies and Math Computation. These results suggest that visual spatial ability may be more important for understanding math conceptually, but that processing speed is more important to actual math fluency. Our results also suggest that there are additional underlying cognitive skills needed for math computational that were not included in this study.

ALDANA, J., WILSON, K.
Levels of Anxiety in College Students with ADHD Symptomatology
Previous research has shown that increased levels of anxiety may be present in college students with ADHD. Students with ADHD face a variety of challenges that can hinder their academic, social and personal life. There is little research, however, on college students with ADHD and comorbidity anxiety. The purpose of this study was to compare the anxiety levels of college students with AD/HD symptomatology and students without AD/HD symptomatology. Sixty-nine college students at a university in Southern California participated in a large study focused on attention, executive functioning, academic performance and psychosocial functioning in students with AD/HD symptomatology and those exhibiting AD/HD symptomatology. The participants (N=69) that included 20 males (29%) and 49 females (71%) of various ethnic groups between the ages of 18-55 (M=27.36), completed a battery of tests and questionnaires such as the Brown ADD scale, Beck Anxiety Inventory, a questionnaire focused on AD/HD symptoms and a questionnaire that collected medical and social history. These measures and questionnaires were used to examine the relationship between AD/HD symptoms and anxiety. Data was collected in two phone screenings and one in-person session. It is hypothesized that students with AD/HD symptomatology would have higher levels of anxiety compared to normal controls. A chi-square test was performed and there was a significant association between anxiety levels and AD/HD symptomatology $X^2(3,N=69)=12.81, p=.005$.

SPEELMAN, C.N., FIUMEDORA, M., FISCHER, M., SHEAR, P.K.
Age of Onset in Temporal Lobe Epilepsy is Associated with Emotional Functioning
Statement of the Problem: In addition to their well-documented cognitive deficits, individuals with temporal lobe epilepsy (TLE) are at greater risk than those in the general population to experience psychological distress (Norvack, 2002). It is estimated that 70% of those with epilepsy have a lifetime mental health diagnosis (Victoroff, 1994). For those with TLE, longer duration of illness is associated with poorer memory functioning (Cheung et al., 2006) and quality of life (Edefonti et al., 2011), and earlier age of onset predicts greater anxiety and depressive symptoms (Sultan et al., 2017). The aim of the current study was to extend this line of inquiry to a broader measure of psychopathology. We hypothesized that earlier age of illness onset would be associated with greater symptomatology on the MMPI2 and greater cognitive dysfunction. Participants: Patients were 33 adults with video-EEG verified, medically refractory TLE who were referred for neuropsychological examination in conjunction with their evaluation for possible epilepsy surgery (22 left TLE and 11 right). The sample had a mean age of
38.30±10.55, age at onset of 21.56±12.72, years of education of 13.64±2.37, 49% were female, and 88% were White. Procedure: All participants consented to inclusion in the Registry for Epilepsy Neuropsychology, and data were retrieved for those who generated valid MMPI-2 protocols and had completed the WAIS-IV as well as measures of executive functioning (Trailmaking Test), verbal memory (CVLT-II), and visual memory (BVMT-R). All participants were required to have a 6th grade reading level or above, confirmed with the WRAT4 (98.00±11.45). Results: In contrast to other reports, earlier age of onset was associated with slower Trailmaking Test A performance ($r(33) = .32; p = .04$) but not with the other cognitive measures. In addition, earlier age of onset was significantly related to greater elevations on the Paranoia ($r(33) = -.31; p = .04$) and Schizophrenia ($r(33) = -.32; p = .04$) scales of the MMPI-2, and there was a trend towards a similar relationship with Social Introversion ($r(33) = -.24; p = .09$). Conclusion: In this sample of medically refractory patients with TLE, earlier age of disease onset was associated with greater self-reported emotional distress than was later onset. These elevations fell primarily on scales that often reflect feelings of suspiciousness or mistreatment, alienation or unusual experiences, and social discomfort. Thus, TLE patients may be experiencing symptoms in domains that are not typically assessed with the depression and anxiety measures that have more frequently been the subject of research in this population.

NAVARRO, G.Y., HICKEY, C.Y., SCHULTHEIS, M.

The neuropsychological correlates of the cognitive based assessment.

Objective: Prior research has identified executive dysfunction as a barrier to vocational functioning for individuals with Multiple Sclerosis (MS), however the exact cognitive domains implicated have yet to be distinguished. Towards this aim, two theoretically based adaptations were added to the Vocational Multitasking Test (VMT), a performance based measure of multitasking ability. The VMT involves a competition of four tasks: managing finances, telephone communication, purchasing office supplies, and calculating a timecard. The adaptations include: 1) increasing time allotment to complete the VMT (Time) and 2) introducing a structured planning phase before initiation of the VMT (Plan). It was hypothesized that measures of processing speed would be correlated with (VMT-Time), while measures of executive functioning would be correlated with (VMT-Plan).

Methods: As part of a larger study, persons with clinically defined MS (n=45) were administered the VMT across two time points. At time point 1, participants were administered the standard VMT providing a baseline score. At time point 2, participants were randomly assigned to either VMT-Plan (n=15) or VMT-Time (n=30). To evaluate performance on the VMT, Total Score and several qualitative VMT variables were analyzed (i.e., Total Errors, Total Task Changes, and Simultaneous Task Attempts). Difference scores were calculated between the standard and adapted VMT conditions for the outcome variables. A composite score was then calculated for measures of processing speed (OralSDMT and PASAT) and executive functioning (D-KEFS Tower and Card Sorting). Correlation analyses were then conducted to investigate the relationships among: 1) the processing speed composite score and VMT-Time and 2) the executive function composite score and VMT-Plan.

Results: The difference in Total Score within VMT-Plan negatively correlated with measures of processing speed ($r = -.539, p = < .05$). Within VMT-Time, we did not observe significant correlations with processing speed or executive function composites. An exploratory analysis examining performance on the sub-tasks of the VMT-Time, indicated that processing speed was significantly correlated with a change in performance within the telephone task. ($r = .540, p<.05$).
Within VMT-Plan, measures of processing speed positively correlated specifically with performance change in the timecard task ($r= -539$, $p < .05$). Finally, there were no significant correlations between total task switches and simultaneous switch with measures of neuropsychological assessments.

Discussion: Persons with multiple sclerosis frequently experience a change in job status linked to executive dysfunction. This current sought to evaluate the neuropsychological correlates of the compensatory modification within this ecologically valid vocational measure to begin to understand the impact that executive dysfunction has within workplace. The study demonstrated that processing speed, a common symptom of MS, correlates with a change in performance. Understanding these results and the deficits presented with this ecologically valid task, rehabilitation strategies can be better tailored to accommodate persons with MS in the workplace.

NAVARRO, G.Y., HICKEY, C.Y., SCHULTHEIS, M.Y.

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Interactions Between Ethnicity, Gender and Visual Memory: the EMBRACED Complex Figure Task

Statement of the problem: Different Complex Figure Tests (CFT) have been extensively used for the evaluation of visuospatial constructional ability and visual memory and for measuring executive functions mediated by the prefrontal cortex. Some studies have revealed small or no differences between males and females on CFT performance (i.e. Peña-Casanova et al., 2009), while other researchers have reported that sex had an influence on performance, with males performing better on every condition of the test (Gallagher & Burke, 2007) or on the delayed recall trial only (Caffarra et al., 2002). However, the relationship between ethnicity, gender and visual memory lack investigation due to most studies focusing on only a single ethnicity. The aim of the present study is to examine the relationship that gender and culture share with each other as well as with visuospatial ability.

Participant: In this study, participants were grouped by ethnicity (Hispanics and non-Hispanics in the US, and Spaniards) and by gender. The total number of participants in this study was 54. Of them, 12 were Hispanics, 25 were Non-Hispanics, and 17 were Spaniards. The gender ratios (F:M) in each ethnic group were 5:6, 13:9 and 14:3 respectively. The data presented here were collected using the EMBRACED computerized battery.

Procedure: This study uses a computerized version of the CFT included in the EMBRACED battery. This computerized task consists of three test conditions: copy, immediate recall and delayed recall. Participants are first required to copy a complex image by drawing with their finger on an iPad screen. Three minutes later they are asked to draw the same image from memory, and again 20-30 minutes later. All 3 drawings are saved by the application and subsequently scored by the research team using a scoring system based on location, accuracy and organization.

Results: A mixed between-within subjects analysis of variance was conducted to compare scores in the three different measures of the CFT in the three cultural groups and by gender. There was no interaction between trials, gender, and ethnic group. The interaction between trials and gender was marginally significant (F= 3.189, p= .05) and non-significant for the combined effects of trials and group. There was a significant main effect of group (F = 3.867, p = .028) with Spaniards performing better than Hispanics (p= .021), but there was no significant main effect of gender.

Conclusions: Our results do not support a differential effect of gender in our different cultural groups. However, culture of origin appears to influence the perception of the figure and the approach to this visuospatial task, which could explain the variation in scores obtained in our study. Overall, these findings point to the need of specific and culturally-adapted norms for
neuropsychological tests, in particular for those assessing visual memory. Further studies will be needed to determine the precise load of different cultural variables and its potential interaction with gender.

Effects of cultural variables on the learning curve of words: the EMBRACED Verbal Memory Task
Statement of the Problem: Learning style tends to be different among cultural groups. Factors such as language, culture, and teaching methods can have an influence in the learning process. However, there is little research dedicated to knowing the effect of culture on verbal learning tasks. The present study is aimed at studying the effect of verbal learning by studying the learning curve in the computerized EMBRACED Verbal Memory Task (VMT) in three different cultural groups: Non-Hispanics, Hispanics and Spaniards
Participants: The present study includes a total of 74 participants from the broader EMBRACED project. Of them, 49 are non-Hispanics, 13 are Hispanics, and 12 are Spaniards.
Procedure: This study uses a sub-sample of a larger normative study for the EMBRACED computerized battery. The VMT in the EMBRACED battery is inspired by the California Verbal Learning task and the TAVEC (Spanish version). In this task, participants are presented with a 16-words list a total of 5 times for the learning trials (trials 1-5). In each trial, their voice is automatically recorded in the iPad as they recall as many words as they can. These recordings are subsequently scored by the research team for correct words (hits), intrusions (words not in the presented list) and perseverations (repetitions). For the present study, we analyzed the number of correct words (hits) in each of the learning trials (trials 1-5). A mixed within-between subjects analysis of variance was performed using the 5 learning trials as the within-subjects factor and the 3 cultural groups as the between groups factor.
Results: Results showed no interaction between the trials and the cultural groups. However, the main effects for cultural group and learning trials were statistically significant (F=5.257, p=.007 and F=362.173, p<.05 respectively). Post-hoc comparisons showed statistically significant differences between Spaniards and Hispanics (p=.008). For the trials, linear, quadratic and cubic components were significant (all p>.05), but not order 4.
Conclusions: The overall findings in this study revealed that the learning curve was not different depending on the cultural groups. There were significant differences between the trials in all groups, as is expected with healthy participants increasing the number of recalled words as the learning trials progress. However, the cultural group also showed a consistent effect with Spaniards scoring significantly higher than the Hispanics on all the learning trials. These results point to the need of culturally-adapted norms that can account for the differences attributed to culture. Besides, further research is needed to clarify which cultural factors affect the performance in verbal memory tasks, as well as in other neuropsychological tasks.

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Cognitive Functioning in Drug-Naive Patients with Schizophrenia: Review of Studies
Background: Evidence has established the presence of cognitive deficits in individuals with schizophrenia across domains of attention, memory, language, and motor and executive functioning. Medium- to-large impairments have been identified across neurocognitive domains. However, researchers have examined these effects in patient receiving antipsychotic treatment,
which may improve or impair cognitive functioning idiosyncratically. Therefore, we sought to review and characterize cognitive deficits in first-episode psychosis in antipsychotic-naïve individuals. Moreover, comparisons were stratified to illuminate differences between high- and low- and middle-income countries.

Methods: This review aimed to identify studies that examined the cognition for untreated cases of psychosis available for review between January 2002 and August 2018. A search strategy was generated empirically by examining peer reviewed papers that included the terms “untreated”, “first episode”, or “neuroleptic naïve”. This search strategy which aimed at sensitivity rather than specificity was then applied to the PubMed database. A team of 3 reviewers compiled the final set of 4415 articles. The sensitivity of the search was examined by scrutinizing the abstract and titles of the relevant studies detected by the search. The authors of examined the main text of the studies when further information was needed. Only studies of untreated psychosis, medication naïve, and antipsychotic naïve cohorts were eligible. Studies were excluded if there were patients that had previously been exposed to any antipsychotic treatment, were medication naïve after having been treated prior to the study (i.e. wash-out), if medication status was unclear, if patients were unmediated but failed to provide separate outcome measure for that group, and review/meta-analysis papers. The first 500 studies’ abstract and titles were scrutinized by all members of the research team to ensure a minimum of 80% concordance in coding the articles based on the relevant inclusion/exclusion criteria among all team members.

Results: Twenty-five studies, accounting for 300 comparisons, were included in this review. Across these studies the domains of speed of processing, attention vigilance, working memory, verbal learning and memory, visual learning and memory, reasoning and problem solving, social cognition, reaction time and selective attention, premorbid verbal estimate, visual perceptual learning, procedural learning, visuospatial, and motor speed were assessed. Overall, schizophrenia patients performed significantly worse than healthy controls across domains. However, a significant number of comparisons demonstrated no difference between schizophrenia and healthy controls. This was evident in the domains of verbal learning and memory and reasoning and problem solving. When looking strictly at high-income countries, more non-significant differences were noted in the domains of social cognition and motor speed.

Conclusion: This study demonstrates that significant impairments in cognitive functioning as seen in individuals with schizophrenia. However, further, more methodologically sound evidence would be needed to clarify differences in domains in which limited comparisons have been conducted.
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