COGNITION AS A SIXTH VITAL SIGN: THE ROLE OF NEUROPSYCHOLOGY IN POPULATION HEALTH

WALTER E. WASHINGTON DC CONVENTION CENTER
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As the 131st Annual Meeting of the American Psychological Association approaches, The Society for Clinical Neuropsychology is pleased to announce this year's meeting theme, *Cognition as a Sixth Vital Sign: The Role of Neuropsychology in Population Health*. Our theme this year reflects advancements in the science and practice of neuropsychology, but also its broader role in global health.

This year, our meeting will include expert invited addresses, science-focused talks and poster presentations, as well as many professional development and networking opportunities. New this year is the SCN Member Townhall, and we encourage you to attend. You will learn much about what SCN has been doing for you as a member this past year, as well as upcoming SCN initiatives and opportunities for involvement. This will of course be followed by our ever-popular SCN Social Hour, which will include fun, food, libations, and raffle prizes.

We look forward to seeing you in DC!
FEATURED PROGRAM:
PRESIDENTIAL, INVITED, & FELLOW'S ADDRESSES

5826. Tsoy, E. Development and Validation of Digital Neuropsychological Measures for Early Detection of Cognitive Disorders in Diverse Populations

This session will provide an overview of the current state of digital and technology-assisted neuropsychological assessment and discuss benefits and limitations of integrating computerized tools into clinical practice. It will describe the process of the development, validation, and cultural adaptation of novel digital measures for early detection of diverse populations and discuss the ways in which wide scale implementation of these instruments may reduce late-life healthcare disparities. In this session, there are two goals for attendees: 1) to learn about digital and technology-assisted assessment paradigms, and how they offer unique advantages (and pose unique challenges) for clinical practice, and 2) to increase knowledge about the impact of diagnostic inequities on late-life cognitive disorders among racially, ethnically, linguistically, and socioeconomically diverse individuals - and how digital cognitive assessment tools have the potential to address disparities in the diagnosis/misdiagnosis of neurodegenerative disease.

5864. Lechuga, D. So What Do You Do Anyway at UCLA, Mijo?

The field of neuropsychology is alien to those that lack or have minimal education. This is especially true for those individuals and families with lower income levels who are often from underrepresented cultural and ethnic backgrounds. Non-exposure to appropriate role models, such as professionals in the healthcare professions, further contributes to this decreased familiarity with our field. The lack of familiarity, however, does not necessarily translate into a lack of interest or curiosity. Nor does this translate into an inability to learn, even master, the basic and advanced tenets of neuropsychology or the neurosciences. Dr. Lechuga’s talk represents a personal path, one inspired by a host of bad and a few very good role models. In order to do what I do and have done, there was an early need to educate friends and family about my chosen vocation. There was also an early need to manage the self-doubt that comes with being different, and one of the few within our profession. Emotionally, this path has been variable, but mostly positive. Dr. Lechuga’s talk will share some insight into his own path, so that perhaps this added insight might lead to the inspiration to follow and exceed it.

5888. Dotson, V. Promoting Lifelong Brain Health in Clients and the Community

As brain and behavior specialists, neuropsychologists are in a unique position to work with patients, their families, and others to not only treat brain disease/injury, but also promote brain health/wellness and disease prevention. Dr. Vonetta Dotson is a clinical neuropsychologist, Professor of Psychology at Georgia State University, and author of the book “Keep Your Wits About You: The Science of Brain Maintenance as You Age” Dr. Dotson shares her wit, wisdom, and scientific knowledge to help attendees learn how to engage and educate individuals as well as the broader community in promoting brain health/wellness and disease prevention. The invited address will include empirical evidence, but also practical tips and strategies.
5889. Fallows, R. Primary Care Neuropsychology: Neuropsychologists Delivering on Population Health Outcomes

Neuropsychology has not historically been integrated into primary care settings. However, healthcare is beginning to shift its focus to better address broader population health. In line with this shift, clinical neuropsychologists are now becoming integrated into primary care. Neuropsychologist and invited speaker Dr. Robert Fallows will review models of integration, adaptations to practice, and outcome data. Data regarding efficiency of care will be reviewed with careful attention to several principles of population health, including recommendations for flexible but standardized care, greater access for all, and the role of neuropsychologists in preventative health care. Barriers for integration and considerations for future research and clinical practice will also be reviewed.


There are now a number of treatment options for persons with memory decline with aging and Mild Cognitive Impairment. One such option is the Healthy Action to Benefit Independence and Thinking Program (HABIT), which is Mayo Clinic’s cognitive rehabilitation and wellness program for persons diagnosed with Mild Cognitive Impairment. Dr. Melanie Chandler is a clinical neuropsychologist and Chair of Psychology at Mayo Clinic Florida. She is one of the originators of the HABIT program, having co-written the initial grant for start-up funding in 2005. In this invited address she will summarize key findings in nonpharmacological interventions for memory decline with aging and Mild Cognitive Impairment, describe the HABIT program and its components, and discuss implementation and impact of the HABIT program.

5891. Sanz, J. Improving Neurodevelopmental Outcomes in Congenital Heart Disease: The Role of Neuropsychologists and the Power of Multidisciplinary Collaboration

Children with congenital heart disease (CHD) have an array of adverse neurodevelopmental outcomes, including neuropsychological dysfunction. Clinical and research initiatives to address this issue are growing. Dr. Jaqueline Sanz is a neuropsychologist at Children's National Health System and serves as Co-Director of the Cardiac Neurodevelopmental Outcome Program (or CANDO Program), which monitors the development of children with CHD. As part of her work with the CANDO Program, Dr. Sanz is actively involved in the implementation and monitoring of a large, multi-site clinical data registry for neurodevelopmental data in CHD. In this invited address, she will briefly review characteristic alterations in brain development and patterns of brain injury, and a review of key elements of neuropsychological outcomes. She will then emphasize the importance of multidisciplinary team work in providing neurodevelopmental care for children with CHD, and review the development of multi-site, multidisciplinary collaborative work to promote improvement of clinical outcomes via research and quality improvement initiatives.

5906. Weisenbach, S. Neuropsychology in the Era of Digital tools and Artificial Intelligence: Forging a Path Forward

Advances in technology and artificial intelligence (AI) tools are changing the way that healthcare is practiced across the world, though the practice of clinical neuropsychology continues to rely primarily on paper-and-pencil measures. The Minnesota 2022 Update Conference recognized technology as a
critical branch of knowledge for neuropsychology today, and there is a growing literature related to
digital neuropsychological tools. This talk will provide a brief overview of what is known to date about
the use of digital health tools in clinical neuropsychological training and practice. It will envision how the
training and practice of clinical neuropsychology might look ten to twenty years from now and propose
next steps for integrating our field into an increasingly digital healthcare system. Finally, it will raise
potential ethical concerns that can arise as reliance on technology and use of AI in educational and
clinical settings becomes standard.

5955. Parsons, T. Clinical Extended Reality (Clinical XR) For Neuropsychological Assessment

While science and industry have embraced technology, neuropsychology has been slow to follow suit.
Potential reasons for this reserve involve substantive questions pertaining to assessment; the
economics of clinical practice in a changing healthcare environment; and a reticence to venture into new
assessment models. While discussions continue within the field of neuropsychology regarding how to
respond to technology, new capabilities continue to emerge that offer potential for enhancing the ways
in which science and industry function as well as the fundamental nature of our society. Neuropsychologists in the digital age have increasing access to emerging technologies. This talk emphasizes developing scientific and technological potentials (e.g., novel simulations, sensors, data analytics) for augmented characterization of neurocognitive, behavioral, affective, and social processes. Particular emphasis is placed upon clinical extended reality (Clinical XR).

5957. Lanca, M. SCN Presidential Address: Cognitive Health as an Integral Part of Population Health Management

Population health is a conceptual framework for assessing community health to drive policy
development, research, and resource allocation. Operationally, it reflects the health of a population as
measured by health status indicators, but it is also influenced by social, economic, and environmental
factors, to drive the health services. With increased emphasis on population health management, health
delivery models are expanding from largely complaint-driven care to predictive and early intervention
models. With this paradigm shift, the goal is to promote early identification, intervention, and disease
prevention. Understanding cognitive health as part of population health management is central to
effective healthcare. This talk will elaborate a population health framework by examining the basic
tenets of population health and elaborating the essential role of cognitive health in overall healthcare.
This new framework creates an opportunity to promote neuropsychology’s role within population health
beyond its usual boundaries, as neuropsychological assessment is typically geared toward disease
detection and management. Increased emphasis on cognitive health initiatives that increase widespread
cognitive screening, neurotechnological advances and greater understanding of social determinants of
cognitive health will be elaborated as examples of integrating cognitive health as a pillar of population
health management.

Women represent an understudied group across scientific disciplines, including neuropsychology. Contemporary research seeks to address longstanding gaps in our understanding of women’s neuropsychological functioning by investigating how women’s unique biopsychosocial factors affect their neuropsychological presentations. The goal of this session is to highlight four women’s-focused research initiatives. Presenters will share findings from lines of research spanning multiple neuropsychological topics, unified by their focus on women as participants. The audience will be encouraged to consider and discuss how such research can be disseminated and promoted at the student, trainee, and professional levels as well as how women’s issues in neuropsychology can be considered more thoroughly in clinical practice. This session meets the definition of continuing education (CE) as defined by the Standards and Criteria for Approval of Sponsors of Continuing Education for Psychologists. Specifically, this session is relevant to psychological practice, education, and science, as it will describe unique features of women that should be considered in neuropsychological clinical work, training/education of aspiring neuropsychologists, and future inclusionary research. This session will enable psychologists to keep pace with the most current scientific evidence regarding women in neuropsychology, a traditionally understudied topic that has gathered contemporary support and has several ongoing lines of research. Finally, this session will allow psychologists to improve their services to the public, as they will better understand how to meet the needs of women neuropsychological patients. This session will also conform to Standard D, as all research presented will be evidence-based in its approach to assessment/intervention.


Outreach is an integral part of neuropsychologists’ work, yet little is known about current outreach practices and needs of providers, or best practices for outreach projects. This collaborative session of Division 40/SCN subcommittees includes three brief presentations on community outreach in neuropsychology. Dr. Carolyn Parsey and the SCN PIAC Community Outreach subcommittee will present findings from a 2022 survey of 86 neuropsychologists on outreach practices and needs. Highlights include major gaps in public knowledge of neuropsychology and services provided, resources and service access for disadvantaged and diverse populations, and availability of appropriate tests and normative data. Dr. Lynette Abrams-Silva of the SCN Ethnic & Minority Affairs subcommittee will present a recent outreach project where neuropsychology trainees collaborated with a local organization assisting people out of homelessness, to perform brief neuropsychological screenings. Details of the program, including development of the process and patient benefit, will be discussed. Third, Dr. Taylor Schmitt will present about New2Neuropsychology (N2N), an organization that aims to increase diversity in the field through outreach to historically underrepresented students. She will discuss N2N goals and activities, how to get involved, and strategies to find and secure funding for community outreach projects. Following the presentations, participants will engage in a discussion of current and potential outreach projects in their own communities. Participants are encouraged to bring their own ideas and
questions about community outreach and network with other attendees. Participants will leave with a better understanding of current approaches and opportunities for their own community outreach projects.


This critical conversation is hosted by the Society for Clinical Neuropsychology's Association of Neuropsychology Students and Trainees (ANST). There has been an evolution in the use of technology for neuropsychology training over the last two decades - with expansive use in response to the COVID-19 pandemic. In an increasingly modernized world, the ability to communicate educational content via videos, podcasts, social media, and webinars allows individuals to remotely access information from experts in a cost-effective manner. Historically, clinical neuropsychology programs would gather trainees and faculty at a scheduled time to discuss cases and a wide range of topics approved by the Houston Conference Guidelines. While considered the standard for formal didactic training, there are pitfalls. Demanding schedules of graduate students and trainees may make it impossible for students to attend didactics due to scheduling, vacation, spending additional time with a patient and more. As such, valuable information may not be delivered. On demand educational opportunities have allowed students to receive the information they need when conducive to their schedule. Further, podcasts videos, and webinars allow trainees to receive up-to-date information from experts within the field, repeat lectures to supplement learning, and aid individuals who require accommodations (e.g., transcripts, subtitles, etc.). The purpose of this symposium is to discuss ways we can integrate technological methods within formal neuropsychology didactic training, as well as the benefits and risks. Future implications for the field will also be discussed.

1451. Burton, C., Cable, S., Gregg, A., Hawley, N., Duvall, S., Ali, J. Inclusive and Affirmative Assessment: Considerations for Gender Identity, Sexuality, and Disability

Designed to complement efforts to improve culturally competent assessment of patients with diverse racial and ethnic backgrounds in the field of psychology, this Critical Conversations session focuses on provision of inclusive assessment to those with diverse gender identities, sexual orientations, and ability levels. This session will increase provider awareness of these aspects and highlight the necessary skills for provision of informed and supportive care. A panel of invited healthcare and advocacy experts will provide insights on working with LGBTQIA+ individuals, those with disabilities, and those facing intersectional and systemic barriers to equitable treatment in healthcare. The panel will review key background information (e.g., difference between sexual orientation and gender identity, importance of correct pronoun usage), skills (e.g., assessment modifications for those with sensory/motor limitations, recommended inclusive language), and best-practice recommendations relevant to the highlighted aspects of diversity. The panel will engage in direct discussion with audience members on case examples designed to highlight the need for inclusive assessment. Cases will feature de-identified vignettes of patients with diverse gender identities, disabilities, and other aspects necessitating unique provider consideration. Through this discussion, audience members will have the opportunity to explore considerations and recommendations from panel members. The moderator and panel experts will encourage discussion from an intersectional lens to increase audience understanding of how identity-based aspects of oppression work in tandem to limit equitable treatment and access to care for many individuals.

The tremendous impact of the Houston Guidelines (1998) in establishing training standards in clinical neuropsychology cannot be over-stated. Over the past 25 years, there has been growing recognition of the need to revisit and revise the guidelines. Out of this need, the Minnesota Conference emerged led by a coalition of representatives from SCN and other major neuropsychology professional organizations. The Minnesota Conference convened in September 2022 and consisted of 56 diverse delegates, several content experts, and members of the Minnesota Conference steering and planning committees to review the Houston guidelines and propose changes with three explicit a priori emphases: 1) competency-based training, 2) technology/innovation, and 3) equity, diversity, and inclusion (EDI). We will share the process of the Minnesota conference and the key proposed changes. Several of the themes that emerged out of the Minnesota Conference discussions align with recent SCN initiatives and the results of the SCN Strategic Planning survey including the need to embrace different models of service delivery based on good data and good ethics, a commitment to EDI, lifelong learning, and advocacy. As part of our symposium, we will actively engage the audience to solicit input on how SCN can uniquely leverage our organizational strengths to support and facilitate the implementation of these historic guidelines.


There is a lack of consensus on the definition of Executive Functioning (EF). EF is often defined as processes that regulate an individual's thoughts and behaviors and/or as specific processes such as working memory, inhibitory control, and cognitive flexibility. Despite a number of studies and assessment tools utilizing the term, the literature exploring EF uses different methodology and constructs, or vague definitions resulting in definitional and practical limitations. The clinical implications of this are sincere. Neuropsychological testing that seeks to identify brain pathology and provide diagnostic clarity and treatment recommendations cannot meet best practice goals if there is not clear support for exactly what EF is, and how test for it. The current program will provide a contextual background on the existing understanding of EF and next steps for clinical practice. Ms. Walukevich will present data from community and college populations exploring diagnostic sequelae. Dr. Kavangh will detail the clinical implications of the EF construct, and the available tools used to measure it will be reviewed from the perspective of neuropsychological testing practice. Dr. Cangemi will discuss how to understand and evaluate EF within the context of neurodevelopmental disorders such as Autism Spectrum Disorder. Finally, Mr. Simmons will add depth to our understanding of the limits of a deficit model in by exploring the role of cognitive creativity. There is significant need, in both theory and practice, to gain a greater understanding of the complexity of EF, as well as the strengths and weaknesses of our current measurement abilities.


In 2022, the Assistant Surgeon General convened an invited group of neuropsychologists and other experts to gather information about the neurocognitive and related sequelae of the effects of long COVID. The neuropsychologists formed a group work to submit to a status of the research, practice, and policy aspects of long Covid. The group has been working with other advisors (e.g., AACN) to address the
specific pathology, neuropsychological concomitants, practice approaches, and policy implications. This symposium will provide the first public presentation of all of these aspects as well as provide recommendations for a plan of research at the national level and potential practice patterns that may enhance understanding the multimodal and complex aspects of the long term effects of COVID-19.


This interactive symposium features presentations to aid early career investigators in navigating the complexities of a clinical research career, including securing funding, designing studies with an eye toward DEI, forging successful research collaborations, and leveraging social media to promote and brand a research program. Dr. Jovier Evans from the National Institutes of Mental Health (NIMH) will kick off the symposium with a presentation on strategies to secure research funding, including an overview of NIH grant funding mechanisms, strategies for identifying awards intended for early-stage investigators, communication with program officers, and tips for grant writing success. He will also discuss the NIH Loan Repayment Program and Diversity Supplement Program. Dr. Vonetta Dotson from Georgia State University will then address the importance of engaging diverse populations in research to increase generalizability of study findings and reduce healthcare disparities and discuss methods for recruiting individuals from underrepresented groups. Next, Dr. Madison Berl from Children's National Hospital will discuss strategies to forge collaborative, interdisciplinary and interinstitutional relationships to build connections and enhance your research. Last, Dr. Lucas Driskell from Yale School of Medicine will present on the use of social media to disseminate scientific/research findings and provide tips on how to leverage social media to build new connections and relationships within the field and to promote one’s professional identity and reputation. Then, Dr. Kati Pagulayan will moderate an interactive Question and Answer session and discussion between symposium attendees and our panel of speakers.


In this session, we provide practical approaches for early career participants interested in expanding their practices within integrated care teams. In recent years, there has been a call to transform traditional neuropsychology practice to align with an integrated healthcare model. Integrated care prioritizes a biopsychosocial approach to treatment, rapid turnaround of services, and seamless collaboration between care team members to optimize patient outcomes. Solid organ transplant represents a highly integrated, multidisciplinary service wherein specialty clinical neuropsychologists are unique and valuable. Dr. Jenessa Price will set the stage for transplant neuropsychology as a specialty practice; she will discuss the biopsychosocial assessment as an essential component to neuropsychological formulation, highlight relationships between cognition, adherence, and candidacy for transplant, and share opportunities to leverage one’s expertise when innovating the standard of care in transplant. Dr. Kyle Jennette will walk through a paired case presentation showcasing the multidimensional complexities among two individuals completing neuropsychological evaluation as part of the transplant workup. He will touch on medical comorbidities, health literacy, and psychosocial factors relevant to interpretation and candidacy, with opportunity for attendee participation. Finally, Dr. Neil Pliskin will discuss economic considerations to maximize neuropsychologists’ value and promote unique skills in integrated healthcare. Attendees will learn how to frame neuropsychological evaluation to support readiness for transplant, how to deliver comprehensive yet concise feedback to team members, and strategies to shift practice to focus on improved outcomes.
Loneliness and cognition may have bidirectional associations. Loneliness may elicit hypervigilance to social threats that overburdens cognitive systems. Conversely, cognitive difficulties may contribute to loneliness by limiting social engagement. Associations between loneliness and cognition have been studied in older, but not midlife adults. If there are associations between loneliness and cognition earlier in the lifespan, loneliness and cognitive interventions might target mechanisms to mitigate future cognitive decline and social isolation. This longitudinal study determined whether loneliness and cognitive performance have bidirectional associations in midlife women. We hypothesized that loneliness would predict poorer cognitive performance and vice versa. Participants from the Study of Women’s Health Across the Nation (N = 2,666) self-reported loneliness and completed cognitive measures at four study visits, approximately 2 years apart. Cognitive measures included episodic memory (East Boston Memory Test [EBMT]), processing speed (Symbol Digit Modalities Test [SDMT]) and working memory (Digit Span Backwards [DSB]). Primary analyses were completed using cross-lagged panel modeling. As expected, loneliness was associated with poorer EBMT immediate recall, and better SDMT scores were associated with less loneliness, two years later (ps < .001). During midlife, there is evidence of a bidirectional association between loneliness and cognitive performance. Future research examining subjective (e.g., qualitative) experiences about the associations between cognition and loneliness might elucidate these associations. For example, perhaps hypervigilance from loneliness impairs the ability to immediately attend to verbal information; or processing speed may facilitate engagement in social interactions.

Sleep misperception represents a discrepancy between objectively measured sleep parameters and subjectively reported sleep estimates. Individuals with chronic subjectively inadequate sleep (i.e., insomnia) tend to misperceive their sleep more than normal sleepers. However, the cognitive basis of sleep misperception is yet unknown. As subjective sleep reports partially rely on memory demands, we investigated the relationship between sleep misperception and verbal memory. Actigraphy and sleep diaries (mean number of 8.97±3.19 nights) were recorded in 38 participants (50% women, mean age = 32.9±7.1 years, 16.2±2.5 years of education) with self-reported chronic sleep disturbance and histories of trauma. Total sleep time (TST) misperception values (Δ) were calculated by subtracting objective (actigraphy) from subjective (sleep diary) estimates. Participants were administered a neuropsychological battery, including the CVLT-II. Linear regression was used to test the relationship between mean ΔTST and different dimensions of performance on the CVLT-II controlling for age and education. The model predicted mean ΔTST ($R^2 = .161$, $F(2,35) = 3.346$, $p = .047$) with CVLT-II age-corrected intrusion scores as the sole significant predictor after accounting for years of education ($\Delta$TST Mean: $B = 42.4$, CI: [8.931, 75.869], $t = 2.572$, $b = .402$, $p = .015$; Education: $p = .947$), such that greater underestimation of actigraphic TST was associated with fewer errors (i.e., greater accuracy). No other performance dimensions on the CVLT-II were associated with mean TST misperception. Results indicate
a relationship between sleep perception and verbal memory functioning in individuals with subjective sleep disturbance. Specifically, greater misperception of sleep was associated with greater overall accuracy on a verbal recall task. Clinical implications and limitations are discussed.

215. Dimmick, A. & Wiechmann, A. Providing Validation for the TEFE: A Performance-Based Assessment of Safety for Geriatric Patients

Impairments in executive functioning coupled with difficulty performing activities of daily living are common among individuals diagnosed with dementia. Recommendations regarding independent living made to clients and family members often hinge on the ability of clients to continue to live independently without safety concerns—an ability that can be difficult to determine. The Test of Executive Functioning in an Emergency (TEFE) is a method for assessing functional abilities of adults with cognitive impairments in emergency situations. Prior research has demonstrated that the TEFE significantly correlates with other measures of executive functioning. The purpose of the current study was to provide additional support for the clinical utility of the TEFE. In an outpatient sample of 287 adults receiving neuropsychological assessment services, the TEFE demonstrated acceptable internal consistency (α = .79). The measure also demonstrated convergent validity, significantly correlating with other measures of executive functioning. Further, the TEFE demonstrated excellent criterion validity, significantly predicting client total CDR score (β = -.54, t(202) = 20.26, p < .001), MMSE score (β = .58, t(284) = ., p < .001), and BDS score (β = .51, t(281) = 9.90, p < .001). Finally, this study provided external validity for the TEFE as results indicate that individuals with dementia performed significantly worse on the TEFE than individuals with an MCI (d = 1.53). These results highlight the utility of implementing the TEFE in clinical settings to assist with diagnostic impressions as well as determining functional abilities of adults with cognitive impairments.


Web-based cognitive assessments allow for increased accessibility to measure cognitive performance for older adults. However, variations in technology hardware may affect an individual's performance on online tests (Parsons et al., 2017). As vision is strongly connected to cognitive performance (Nagarajan et al., 2022), this study evaluated if near-sighted vision (NV) predicts performance on web-based memory tasks in older adults during the Covid-19 pandemic. A sample of community-dwelling individuals (n=14755; Medu =13.4; Mage=69.2; 58.4% female; 66.2% White) was collected from the Health & Retirement Study. NV and subjective memory (SM) were determined by subjective ratings and objective memory (OM) was evaluated by a web-administered, visual 40-word list learning test. Correlation analyses demonstrated a significant positive correlation (r=.31, p<.001) between NV and SM and a significant negative correlation between NV and immediate word recall (IR; r=-.13, p<.001) and delayed word recall (DR; r=-.14, p<.001). Regression analyses found that NV and SM explained 3.6% of the variance in IR (F=35.6, p< .001) and 3.8% in DR (F=38.2, p< .001). Ratings of NV significantly predicted performances of IR (β=-.149, p=.001) and DR (β=-.189, p<.001). SM ratings were also a significant predictor of IR (β=-.362, p< .001) and DR (β=-.433, p<.001) in the model. This study highlights the need for neuropsychologists to assess and consider vision status for visual, online cognitive assessments. This study also suggests that in addition to subjective vision ratings, an adaptive objective vision test may be beneficial to improve interpretations of web-based cognitive measures for older adults.
The Multicultural Neuropsychological Scale (MUNS) is a neuropsychological assessment being validated to be used across cultures. Neuropsychological tools, like the MUNS, can be used to understand recent research which has found that some individuals previously diagnosed with COVID-19 experience neuropsychological impairment (e.g., Becker et al., 2021; Cysique et al., 2021). To provide insight into whether such impairment can be seen in MUNS results, performances of individuals with previous COVID-19 diagnoses were compared to those of individuals not previously diagnosed. Students from James Madison University who met inclusionary criteria were recruited via email (N = 40; age: M = 20.12, SD = 1.90; female = 87.5%). Students completed a background questionnaire and effort measure (REY-15; Rey, 1964) before completing the MUNS battery. The MUNS consists of eight subtests, with four delayed trials, in five domains of cognitive function. Independent samples t-tests were conducted to determine if individuals with and without previous COVID-19 diagnoses performed differently on the various subtests. Thirteen out of 40 (32.5%) participants had previously been diagnosed with COVID-19. Individuals with prior COVID-19 diagnoses had significantly lower scores on the Word-List Learning (t(38) = 2.24, p = .016) and Old Arrows subtests (t(38) = 2.14, p = .020). Significantly different performances on MUNS subtests which assess memory and attention were found. The results provide some data regarding neuropsychological impairment in individuals previously diagnosed with COVID-19. Researchers should continue to examine such differences, particularly in the domains of memory and attention.

Noninvasive methods are imperative in treating major depressive disorder (MDD), especially for those affected by treatment-resistant depression. When a patient has tried medication and cognitive therapy, it is suggested that more invasive methods are used to provide relief. Neurofeedback is a promising way to train those with depression to learn how to regulate their brain activity, to treat symptoms. One of the most common symptoms of MDD is a lack of motivation, and previous research has indicated that this could be because of impaired activity in the mesolimbic dopamine system stemming from the ventral tegmental area (VTA). In the present study, 7-Tesla functional magnetic resonance imaging was used for neurofeedback-based training of the VTA in individuals with depression in a randomized, sham-controlled pilot trial. Before and after training, participants completed clinician-administered surveys of depressive symptoms. Results indicated that all participants experienced higher functioning and fewer depressive symptoms immediately following the neurofeedback intervention. However, these results were not maintained over time, and there was no difference between the treatment and the sham groups. This early work provides evidence that those with MDD can regulate their VTA activity, providing a solid foundation for future neurofeedback research.

Black women are at higher risk than white women for discrimination and cognitive impairment in late life. It is not known if discrimination is a risk factor for cognitive decline in Black women and if so, what factors are protective against cognitive decline. Using the stress-buffering hypothesis, we tested hypotheses that discrimination would be associated with poorer cognition in midlife Black women and
that social support and spirituality would protect against the deleterious effects of discrimination on cognition. Design and Participants were midlife Black women (N = 669) from the Study of Women’s Health Across the Nation (SWAN). Discrimination was measured by the Everyday Discrimination Scale. Cognitive outcomes included episodic memory (East Boston Memory Test), processing speed (Symbol Digit Modalities Test), and working memory (Digit Span Backwards). Protective factors of social support (MOS Social Support Survey) and spirituality were assessed. Structural equation modeling was used for primary analyses. Results: Findings were contrary to expectations. Discrimination was associated with better immediate recall. For women with average and high emotional support, greater discrimination was associated with better immediate recall than for women with low emotional support. For women with high spirituality, greater discrimination was associated with better processing speed. Discrimination had unexpected positive associations with attention-based cognitive skills for midlife Black women. Perhaps discrimination experiences enhance vigilance. Emotional support appears to strengthen the association between discrimination and immediate learning and spirituality strengthens the association between discrimination and processing speed. Further research to better understand these associations is needed.

1148. Marshall, S. & Bridgers, K. The Relationship Between Adverse Childhood Experiences and Executive Functioning Dimensions

More research is needed that investigates how and to what extent adverse childhood experiences (ACEs) are related to problems with neurocognitive executive functioning (EF) skills. Existing research has documented that ACEs are related to many physical and mental health problems such as heart disease, clinical depression, sleep disturbances, physical inactivity, obesity, substance abuse, diabetes, among others (e.g., Hughes, et al., 2017). The current study analyzed how ACEs were related to difficulties in two core dimensions of executive functioning (EF), that is, inhibition (i.e., behavior regulation skills) and working memory (i.e., metacognition skills). College students (N = 388) were administered the ACE Questionnaire, (Felitti et al., 1998), and the Behavior Rating Inventory of Executive Function Adult Version (BRIEF-A; Roth, Isquith, & Gioia, 2005). Results indicated ACEs significantly predicted difficulty with global EF skills. This was also the case when each EF dimensions was looked at individually. ACEs predicted significantly more EF inhibition and working memory problems. ACEs were slightly more associated with EF inhibition difficulties in comparison to EF working memory difficulties. Overall, finding clarify the notion that ACEs are linked to disrupted EF behavior regulation and metacognition skills. These findings contribute to ACEs and EF research by utilizing an EF dimensional approach on a non-clinical US sample of college students.

1455. Bosworth, B., Ortega, A., Hincapie, D., & Curiel-Cid, R. Diabetes Mellitus as a Risk Factor for Alzheimer’s Disease in African Americans

To investigate the role of DM in the progression of cognitive decline in AA. Data Selection: Key words: diabetes, Alzheimer’s disease, cognitive impairment, and African Americans. Utilized databases included PsycInfo, PubMed, PsychNet, and Medline. Authors included articles that compared cognitive function both within AA samples and versus white counterparts. Articles were excluded if participants had neurodegenerative conditions or preexisting dementia. Coexisting vascular conditions were not excluded. DM Status was measured via biomarkers (fasting blood glucose and hemoglobin A1c) and self-report. Cognition was assessed using a variety of neuropsychological tests. Articles were excluded if cognitive measures were solely used for screening purposes. AA DM groups showed a significant accelerated cognitive decline as compared to those without DM and white counterparts. On average, AA
DM samples showed a decrease of cognitive scores equivalent to a 2.5-year increase in age compared to non-DM controls. Further, a greater age-related decline was observed in this population. AA DM cognitive scores in domains such as processing speed, verbal fluency, memory, and global functioning were consistently different to non-DM controls, regardless of race. When comparing results to white DM samples, advanced age was associated with decreasing performance. The connection between DM and AD is now an undeniable phenomenon often called “Type 3 Diabetes.” Overall findings are demonstrative of a significant relationship between DM and cognitive impairment in AA. However, AA communities continue to be understudied, despite the high prevalence of diagnosis, increased risk for more frequent/severe DM-related complications, and other related vascular risk factors.

1492. Grewal, D., Weinman, J., Gupta, N., & Keller, J. Effects of Childhood Trauma on Indices of Executive Functioning

A wealth of literature has demonstrated impairments in neuropsychological functioning among individuals with a history of trauma. Previous research has indicated a modest effect of trauma on prefrontal cortex/cingulate-mediated executive functioning tasks. However, few studies have examined how different type of trauma effect executive functioning. The present study examined the impact of childhood trauma on executive functioning as measured by the Stroop test. Participants who reported high scores on the Childhood Trauma Questionnaire (n=53) subsequently underwent neuropsychological assessments. Results showed that those who experienced emotional abuse (F(1,46)=3.92, p=.05, ηp2 = .078) or physical neglect (F(1,45)=8.67, p=.005, ηp2 = .161) had effect on the Stroop Color word performance. In both cases, those who experienced emotional abuse or physical neglect completed fewer words accurately compared to those without trauma. There was no effect on Stroop performance for physical or sexual abuse or emotional neglect. The partial eta squared value of .161 suggests that approximately 16% of the variance in Stroop scores can be attributed to one's history of childhood physical neglect. These findings indicate that physical neglect during childhood significantly impacts executive functioning. This study suggests that individuals with a specific type of childhood trauma may exhibit difficulties in executive functioning. It is hypothesized that there may be hypoactivation of brain regions involved in executive processing, potentially contributing to a notable impact on their ability to disengage from salient stimuli. Additionally, the results of this study highlight the importance of accounting for the type of trauma when evaluating effects on neurocognitive impairment.

1702. Vann, D., Rapport, L., Sanders, G., Broomfield, R., & De La Garza, R. Computer Equipment in Tele-assessment is Confounded with Performance and Demographic Characteristics

Remote neurocognitive testing (RNCT) relies most fundamentally on a reliable digital environment. Research supports the general validity of RNCT, yet research on nuances of the testing environment is still needed. The equipment used by examinees should not be associated with test scores they receive. Nonetheless, we used secondary analysis of data to examine the hypotheses that a visual task (Cambridge Face Memory Test; CFT) would be associated with monitor quality, whereas computer operating system and demographic characteristics would not. Metadata recorded frame resolution (maximum picture quality to display the task) and operating system (Win32 vs. MacIntel) of equipment used by 44 adults with moderate-to-severe traumatic brain injury (TBI) and 44 healthy adults (HA). Spearman correlations indicated that monitor quality showed significant (p < .05) medium correlation with CFT-accuracy within both HA (rho = .26) and TBI (rho = .27) groups. Weak correlations (rho -.05 to -.17) were observed for the total sample and within groups with age, education, and IQ estimated via
Wechsler Adult Test of Reading (WTAR). Unexpectedly, significant Mann-Whitney tests (all $p < .009$) indicated MacIntel users showed superior performance on CFT-accuracy and response time, younger age, and more education than Win32 users (Z-to-r effect sizes .28 to .36), with nonsignificant difference for WTAR ($\rho = .04$). The pattern of significant correlations was similar within the HA and TBI groups. These findings suggest systematic confounding differences associated with computer equipment used during RNCT that can be easily monitored and elucidated in future research.


Rapport between client and clinician is an important component of neuropsychological evaluations, yet there is little research on this topic (Barnett et al., 2019). The purpose of this study was to investigate the relationship between older adults’ cognitive functioning and rapport with clinicians. Participants ($N = 104$) consisted of older adults (age range: 40-90, $M = 70.67$, $SD = 9.94$) recruited from the local community. Measures included the Mini Mental Status Examination (MMSE-2), three selected subtests of the Weschler Adult Intelligence Scale (WAIS-IV), and the Barnett Rapport Questionnaire (BRQ). The three subtests of the WAIS-IV were factor analyzed to create a composite score for global intellectual functioning. Two hierarchical regressions were conducted with the MMSE score (Block 1) and the WAIS composite (Block 2) as independent variables and the Client or Clinician Total Rapport as the dependent variable. For client rapport, the model was not significant, $R = 0.22$, $F(2,101) = 2.64$, $p = 0.08$. For clinician rapport, MMSE score ($\beta = 0.24$, $p < 0.04$) was significant and explained 10.1% of the variance in clinician rapport, $R = .334$, $F (2, 101) = 6.32$, $p = 0.003$. Cognitive impairment of the client does negatively impact how clinicians rate rapport. This could be due to frustration if the client has a hard time understanding the testing. Additionally, clinicians may not view older adults with impairment as friendly or sociable due to decreased language functioning.

1732. Roberson, C. & Rogers, S. The Effect of Alcohol on Cognition in Patients with Parkinson’s Disease

While there does seem to be a negative effect of alcohol consumption on the motor symptoms of Parkinson's disease (PD), there is limited research on the specific features of cognition affected among patients who consume alcohol and are diagnosed with PD. The present research seeks to explore the impact of alcohol use on the frontal-executive, visuospatial, processing speed, and nonverbal memory skills of those with PD. A total of 141 patients (44 female, $M$ age = 74.19) diagnosed with PD participated in outpatient neuropsychological assessment and were inquired about their level of weekly alcohol intake. Those with PD who consume alcohol, even occasionally, performed significantly worse on Trails B and WAIS-IV Similarities, Arithmetic, and Letter-Number Sequencing, $ps < .03$, than those not consuming any alcohol. Similarly, those with PD who consume alcohol demonstrated significantly weaker scores on WAIS-IV Picture Completion and ROCF 30’ delay, $ps < .05$, than those not consuming alcohol. Each of these significant differences persisted when using ANCOVA procedures to control for a prior history of alcohol use disorders, $ps < .05$. These findings suggest any alcohol use may have a negative impact on the frontal-executive abilities of those with PD and select aspects of their visuospatial functions and visual memory, even when a prior history of alcohol misuse is considered or factored. This may be related to the intersection between PD pathology and alcohol's impact on frontal, parietal, and hippocampal regions. These findings can be used to better guide treatment and research for those with Parkinson’s disease.
1870. Greenwood, N. & Kibby, M. Arithmetic is affected in Reading Disorders and ADHD

Children with ADHD and reading disorders (RD) may perform worse in math than typically developing children (DuPaul et al., 2013; Willcutt et al., 2013). Research on children with ADHD has consistently shown deficits in math. However, the literature is sparse and mixed in findings when focusing on RD. Moreover, there is a paucity of literature on how children with comorbid RD/ADHD perform on math-related tasks. Therefore, this study examined the relationship between the disorders on arithmetic performance. Participants included 282 children (ages 8-13) from a pre-existing database attained through a larger, grant-funded study (R03HD048752, R15HD065627). They were diagnosed with ADHD (31.9%), RD (17.2%), comorbid RD/ADHD (17.2%), other diagnosis (7.7%), or were typically developing (26.0%). The DSM-IV was utilized to diagnose ADHD and RD (current edition at the time of data collection). To measure math ability, the Arithmetic subtest from the WISC-III or -IV was used. A one-way ANOVA was conducted to compare Arithmetic functioning between the 5 groups. Results indicated children with a disorder(s) performed worse on Arithmetic than controls (F(4,282) = 19.403, p <.001); when using Tukey HSD, every clinical group performed worse (ps < .01). Moreover, the RD/ADHD group performed worse than children with ADHD (p < .001), and the RD group tended to perform worse than those with ADHD (p = .06). Hence, results indicate math functioning may be affected worse in RD/ADHD and RD than in ADHD. Findings are consistent with the literature suggesting learning disabilities are frequently comorbid, as well as the literature on ADHD.


A history of suicide attempts is associated with attentional bias toward suicide-related words. Similarly, ideation (SI) and attempts are associated with longer reaction times for positively-valenced words. Although negative interpretation bias for neutral images is well-researched, limited information exists regarding positively-valenced social-emotional stimuli within broader SI context. Some evidence suggests an increased sensitivity to negative compared to positive interpersonal stimuli when SI is endorsed. The current study explored the association between suicide-related cognitions and emotional biases in a facial emotion recognition task. We hypothesized individuals endorsing more severe suicide cognitions would show a bias toward identifying ambiguous faces as sad compared to happy, have a longer response latency for happy faces, and a shorter response latency for sad faces. Ninety-three participants (67.7% female, 77.4% white, mean age=41.86) completed the Emotional Bias Task within the Cambridge Neuropsychological Test Automated Battery (CANTAB), Patient Health Questionnaire (PHQ-9), and the Suicide Cognitions Scale-Revised (SCS-R). Controlling for age and depressive symptoms, more severe suicide cognitions were not predictive of an emotional bias, t=.49, p=.63. However, higher scores on the SCS-R were associated with slower mean response times for happy (t=2.04, p<.05), but not sad (t=1.63, p=.11), faces. These results indicate that individuals with more severe suicide-related cognitions take longer to recognize an ambiguous face as happy, though they are just as likely as participants without these cognitions to categorize faces as happy or sad. Clinical implications and future directions will be discussed.


Cognitive sequelae in post-COVID-19 has been documented (Becker, 2021), with cognitive training (CT) studies underway to possibly address these problems. This study examined remotely-administered CT
in adults who were briefly hospitalized for COVID-19 complications early in the pandemic (fall 2020). Participants were 29 patients (51-63yo) with an average hospital stay of 2.65 days and head CAT uniformly normal and negative for hypoxemia, cerebral infarction or significant pulmonary involvement. Online CT consisted of 18 hours over 3 months (Brain HQ, Lumosity, or Neuropsyconline). Psychiatric symptoms and cognition were assessed, on average, 19.4 days after hospital discharge and one week prior to and following CT. Eight dropped out prior to CT, 10 completed all training, 6 completed 75%, and 5 completed at least 50%. Moderate to large effects were seen in executive ability (ES=0.31) and processing speed (ES=0.49) from baseline to post on the online Penn Computerized Neurobehavioral Battery (CNB). Gains in cognition were highly correlated with improvement in depression and anxiety on the Brief Psychiatric Rating Scale (r's=0.41 to 0.55, p's 0.174). This exploratory examination highlights the feasibility of remotely administered CT during a time when telehealth was a necessity. While there may have been potential benefits of CT, gains in cognition may have been more a function of improvements in mood and a reduction in anxiety, which at the time during the first wave was significant in patients suffering from COVID-19.


Exercise has been found to improve cognitive performance among older adults (Hu, et al., 2014). A recent study also found that active exercise was a better predictor of memory performance than inactive exercise among older Latinx adults (Piazza-Rodriguez et al., 2019). This study investigated whether physical exercise, and depression predicted memory changes over a four-year period among depressed older Latinx adults. The sample of 1,789 Latinx older adults (745 males and 1044 females) was collected from the Sacramento Area Latino Study on Aging. Procedures: Across four years, delayed recall memory performance was measured by the Spanish English Verbal Learning Test and depression was measured using a qualitative questionnaire. The amount and type of exercise (active versus inactive) were measured using a qualitative physical activity questionnaire. Using Mixed Effects Modeling, depression level, the two-way interaction effect between time and depression, the two-way interaction effect between active exercise and depression, and the three-way interaction effect between time, depression, and active exercise predicted change in delayed recall performance (ps < .05). Regressions also indicated that active exercise (β=.099; p=.014), age (β=.085; p=.037), years of education (β=.211; p < .001) and depression (β = -.147; p < .001) significantly predicted delayed recall performance at baseline. Findings indicated that depression and active exercise have interactive effects on memory performance at baseline and over time in Latinx older adults. Active exercise is more beneficial to their memory, especially if they are experiencing depression symptoms.


The COVID-19 pandemic resulted in unprecedented interest in teleneuropsychology (TeleNP) (Bilder et al., 2020). Despite emerging evidence supporting the validity and feasibility of TeleNP (Marra et el., 2020), the specialty is uncertain on its applicability. Consequently, the current research aimed to survey current practices and challenges of tele-assessment among neuropsychologists. Survey data was collected from neuropsychologists recruited via neuropsychology-specific listservs. Frequency analyses were carried out to explore: the sample's demographics, how participants used tele-assessment, and encountered challenges. This abstract provides a generic, preliminary view of the collected responses.
300 participants completed the survey. Most respondents worked in an urban setting (62%), within private practice (57%), primarily serving the adult and geriatric population (45% and 33%) and utilized Zoom (29%) for tele-assessment. Most respondents believe tele-assessment is more appropriate for clinical interviews (33%) and follow-ups (29%) and that they can acquire the same information as through face-to-face format. However, regarding testing, responses were more variable. The most endorsed challenges were connectivity issues (15%), technological incompetence by clients (13%), and assessing nonverbal communication (12%). Orientation and language domains were endorsed to be more accurately assessed, while motor and visual being the most challenging. 53% responded that tele-testing should be used as a screening tool, and most respondents believe tele-testing should continue post-pandemic. This survey results provide regular experiences, perceptions, and encountered challenges with tele-assessment. Findings offer data for clinicians to consider when implementing this assessment format, and background for further developing this assessment approach.


Pediatric cancer and its treatment impact executive functioning (EF). Survivors of pediatric cancer also experience unique barriers to physical activity (PA) engagement. Emerging research links EF deficits to decreased PA engagement, but this association has not been evaluated among pediatric cancer survivors. Thus, this study examined associations between PA and EF in pediatric cancer survivors. Retrospective neuropsychological testing (e.g., WISC-V WMI, CPT-3, D-KEFS Trails) and parent-report surveys, including sociodemographics and PA, from pediatric cancer survivors were utilized. Independent samples t-tests compared physically-inactive vs active cancer survivors’ time-since-treatment, age-at-diagnosis, and EF. Chi-square analyses evaluated risk of inactivity based on cancer type, gender, race, income, and caregiver education and occupation. Logistic regressions tested the relative strength of variables predicting PA vs inactivity in central nervous system (CNS) and non-CNS cancers. Survivors (N=192, Age M=11.92, Range=3-45 y.o.) were predominantly non-CNS cancer (53.3%), male (52.6%), non-Hispanic white (64%), and non-Hispanic black (24%). Greater inactivity risk was identified for females (OR=1.46, p=0.01), lower household income (OR=1.69, p=0.03), and lower maternal education (OR=1.61, p=0.03). Inactive survivors had older age-at-diagnosis (p<.001), and greater time-since-treatment (p=0.075). Logistic regression models were significant (CNS: R2 = 0.44, p=0.01; Non-CNS: R2 = 0.20, p=0.02). Female sex (CNS: OR=13.29, p=0.01; Non-CNS: OR=2.36, p=0.049) and greater time-since-treatment (Non-CNS: OR=1.01, p=0.01) predicted inactivity. No differences in EF were found in physically active vs inactive survivors, contrary to prior research in other populations. Female sex and greater survivorship length were risk factors for inactivity. Future research should evaluate PA-promoting interventions in survivors with risk factors.

In Fishman et al. (2018), self-reported apathy significantly predicted semantic, but not phonemic, fluency in patients with stroke, after controlling for depression. However, there are no studies comparing this relationship in patients with traumatic brain injury (TBI). Further, self-reported apathy may be underestimated due to anosognosia. Therefore, we examined the relationship between informant-reported apathy and both semantic and phonemic fluency in TBI patients, after controlling for depression. A retrospective analysis of TBI outpatients (N=10; mean age=36) was conducted. All were administered Animal Naming, Letter Fluency, and the Beck Depression Inventory, among other neuropsychological tests. Informants were administered the Frontal Systems Behavior Scale. Hierarchical linear regressions examined semantic fluency and phonemic fluency separately. The first model revealed apathy and depressive symptoms as significant predictors of semantic fluency (p=0.015). Upon controlling for depression, apathy was found to be statistically significant (Beta=-0.393, p=0.005), while depression alone was not (Beta=-0.034, p=0.869). The next model showed apathy and depression were not significant in the prediction of phonemic fluency (p=0.259). Unsurprisingly, then, depression alone was not significant in predicting phonemic fluency (Beta=-0.061, p=0.920), as was apathy upon controlling for depression (Beta=-0.790, p =0.113). Overall, informant-reported apathy significantly predicted semantic, but not phonemic, fluency in patients with TBI, after controlling for depression. These results replicate those of Fishman, et al (2018). Although this was a retrospective study with a small N, this study highlights both the dissociation of apathy and depression in TBI, as well as apathy's relationship to semantic fluency and possibly more posterior neuroanatomical processes.

64. Kuschel, S., Swiatek, S., Harris, J., Dawson, N., Oliver, M., & Ord, A. The Cognitive Correlates and Predictors of Growth in Reading for Struggling Readers

The growth of reading and cognitive skills is crucial for children's development. This study examined the utility of incorporating a cognitive framework for reading in intervention design among struggling readers receiving National Institute for Learning Development (NILD) Educational Therapy® over a 3- to 5-year period. Evidence from this quantitative, quasi-experimental study is reviewed in relation to the efficacy of the NILD Educational Therapy® intervention for a group of 60 heterogeneous struggling readers, ages 8–16 years, regarding outcomes for reading fluency, reading comprehension, and a variety of cognitive skills. The findings suggest that the structured literacy plus cognitive intervention made statistically significant positive gains in reading fluency, reading comprehension, and specific cognitive skills such as full-scale IQ (FSIQ) and verbal comprehension. Additional analyses were conducted for specific subgroups of struggling readers, such as by area of reading challenge, FSIQ classification, and diagnostic history, with a variety of positive findings in reading and cognition skills. Multiple regression analyses determined the associative and predictive relationships between changes in specific cognitive skills and changes in reading fluency and comprehension among the stated sample. While changes in the cognitive skills assessed did not predict changes in reading fluency, changes in processing speed did significantly predict change in reading comprehension, over and above reading fluency. These findings are in line with the direct and indirect effects model of reading (DIER), suggesting that foundational
cognitive skills, such as processing speed in this study, may affect the development of reading comprehension skills.

99. Myrick, C., Foster, P., Ward, K., & Loveless, J. Lexical and Semantic Spreading Activation in Mild to Moderate Alzheimer’s Disease

The current study investigates potential significant differences in spreading activation within semantic networks in a sample of patients diagnosed with mild Alzheimer’s Disease (AD), moderate AD, and normal, healthy controls. Prior research on spreading activation in semantic networks has used previously developed corpora that are either outdated and/or derived from various media materials (e.g., books, film, television). We developed a new corpus from participant responses to the Controlled Oral Word Association Test (COWAT) and the Animal Naming (AN) test to subsequently calculate the word frequencies of the responses from patients with mild AD, moderate AD, and controls to the same tests. Results indicated reduced spreading activation in the moderate AD group with relative lexical network preservation across all three groups. These results support known AD pathology with a degradation of semantic networks as the disease progresses through the entorhinal cortex.


Amyotrophic Lateral Sclerosis (ALS) is a progressive motor neuronal disease affecting nerve cells controlling muscle movement. There are three identified phenotypes in ALS: familial inheritance pattern, genetic mutation, or sporadic. This literature review explored the neuropsychological underpinnings of cognitive deficits across all ALS phenotypes and their impacts on quality of life. This literature review analyzed forty-seven articles from the American Psychological Association (PsycInfo), PubMed, and Google Scholar. The first search explored cognitive and behavioral impairments across all ALS subgroups and the genetic and neuronal background encasing ALS as a neurodegenerative disease. The second search analyzed the three different ALS classes: familial having an inheritance pattern, genetic mutation, sporadic, and frontotemporal dementia. The neuronal degeneration found across all ALS phenotypes are known to impair cerebral regions associated with cognitive function. The neuropsychological outcomes are noted across executive functions linked to the theory of mind, apathy, personality, reasoning, and decision-making impacting quality of life. Some limitations in the neuropsychological assessment are due to the distinctive symptom manifestations in ALS. ALS is a multisymptomatic neurodegenerative disorder accompanied by cognitive deficits that impact quality of life and overall psychological well-being. The widespread neurological degeneration impact cerebral regions associated with executive functions necessary to preserve autonomy. Individuals display personality changes and executive skill deficits due to frontal lobe neuronal degeneration. These results may inform future assessment and treatment related to decisional aptitude and end-of-life arrangements in ALS patients.

452. Stafford, C. & Golden, C. Does Occupational Status Uniquely Affect Short-term and Working Memory in Alzheimer’s Patients?

The aim of this study is to determine whether the effects of Alzheimer’s diagnosis on the short-term and working memory of Alzheimer’s patients, as defined by digit span (DS) scores and Weschler Memory Scale (WMS) subtests, vary significantly over occupational status. The data for this study was derived from a large de-identified gerontology database. Participants in the Alzheimer’s group (n=264,
Mage=80.75, 97.3% White) had a formal Alzheimer's diagnosis. Participants in the healthy group (n=20, Mage=64.60, 95% White) had no formal diagnosis. All overall models yielded statistical significance except for the models depicting the effects of Alzheimer's diagnosis on memory, as defined by WMS-R verbal paired associates short-term raw scores [F(2,195)=0.005, p=0.995] and WMS-R visual reproduction recognition scores [F(2,227)=0.001, p=0.999], from Alzheimer's diagnosis. The model illustrating the effects of Alzheimer's diagnosis on short-term and working memory, as defined by WMS-R visual reproduction short-term raw scores, was the only model to vary significantly over occupational status [b=-0.896, SE=0.360, p=0.014, sr2=0.019]. Apart from the visual reproduction short-term raw scores, these findings contradict current literature. Prior research suggests that certain occupations that are more mentally engaging, such as teachers, lawyers, and accountants, may uniquely help to protect against memory decline in patients with Alzheimer's disease. Future studies should investigate why Alzheimer’s patients might perform differently on tests of logical, verbal, and visual memory.


Neuropsychological testing is an important component of the diagnostic work-up for both MCI and AD. Longitudinal research into the preclinical stages of AD and neuropsychological test performance are lacking. This study examined longitudinal differences in test performance on tasks involving object recognition, and semantic and phonemic verbal fluency. Participants were selected from Layton Aging and Alzheimer’s Disease Center database. Healthy controls and individuals with a diagnosis of MCI and/or AD were included. Participants were selected based on diagnosis, age at first visit (A1), and neuropsychological test administrations (N = 1,050; 63.2% male; 87.3% Caucasian). Regression analyses identified multiple significant effects. A1 (p < .001), MMSE (p < .001), performance on block design (p < .001), category (p = .001) and letter (p = .006) fluency significantly differentiated between a healthy control vs. MCI. Differentiating between MCI vs. AD, A1 (p < .001), MMSE score (p < .001), performance on picture completion (p < .001) and category fluency (p < .001) were significant. Supporting inclusion of visuospatial processing and recognition tasks in addition to semantic and phonemic fluency to aid in early identification of AD and in discriminating AD from MCI as well as healthy individuals. Visuospatial processing and object recognition was a stronger predictor of having AD over MCI than phonemic verbal fluency. The use of language-based and object recognition/discrimination screening during the prodromal stages of AD could afford the opportunity for earlier preventative measures, drug intervention, and proper risk assessment.

856. Abinader, M., Sidlow, E., Nunez, C., & Golden, C. Differences in attention among a sample of children with ADHD and Specific Learning Disorder

To measure differences across attention measures in a sample of children diagnosed with ADHD or Specific Learning Disorder (SLD) in reading and writing. Participants were selected from a de-identified child outpatient-clinical database. ADHD group had 268 individuals and the SLD had 109 individuals. The ADHD group had a Mage=9.05(SD=2.83), Medu=3.37(SD=2.61), 52.6% white, and 69.4% male. The SLD group has a Mage=10.16(SD=2.63), Medu=4.15(SD=2.52), 48.6% white, and 71.6% male. Groups differed on age and education. ANCOVAs were used to test differences between groups controlling for significant covariates. The ADHD group, on average, scored higher on the CPT-III omissions[F(1,52)=4.231, p=.045], CATA omissions[F(1,49)=5.634, p=.022], and CATA commissions[F(1,49)=7.878, p=.007]. The SLD group, on average, scored higher on WISC-IV Symbol Search[F(1,104)=13.084, p<.001] and WISC-IV Digit Span[F(1,104)=4.556, p=.035]. No differences were found between groups for CPT-III Hit-Rate, CATA Hit-
Rate, Stroop Color-Word, Trails-A, or WISC-IV Coding. The findings suggest that CATA and CPT-III are similar on omissions but not commissions. This suggests the ADHD group is more likely to respond to non-target stimuli when presented auditorily versus visually. The ADHD group, on average, performed worse across attention measures but this was not detected on all attention measures, suggesting some attention measures may be more sensitive than others. This suggest clinicians should be more purposeful when selecting assessments when differentiating diagnoses. Limitations of the study include individuals being administered different versions of an assessment which limited our sample size. Future directions can explore differences among groups on other variables of attention such as the Conners.

967. Gallardo, L., Bosworth, B., Beaulieu, A., Ortega, A., Hincapie, D., Curiel-Cid, R., & Loewenstein, D. The Association of Semantic Intrusion and Plasma p-tau181 in aMCI

To investigate the association between the pathology of Alzheimer's Disease (AD) and semantic intrusion errors (SIE) using plasma biomarkers and Amyloid PET ratings. 103 amnesic Mild cognitive Impairment (aMCI) and 25 cognitively unimpaired (CU) older adults (N=128) were given a clinical evaluation and a standardized neuropsychological battery, including the Loewenstein Acevedo Scales for Semantic Interference and Learning (LASSI-L). A novel test that maximizes SIE in response to competing targets. Participants underwent amyloid PET imaging, and biomarker analysis (SiMoA for plasma p-tau181, Aβ42/40 ratio, Neurofilament Light protein (NFL) and Glial Fibrillary Acidic Protein (GFAP)). PET imaging results were rated by neuroradiology and received an amyloid positive (Amy+) or amyloid negative (Amy-) diagnosis. Findings showed that the SiMoA biomarkers or the ApoE genotype did not vary between the CU and aMCI Amy- groups. In contrast, aMCI/Amy+ participants had higher overall percentage/levels of ApoE ε4 allele, p-tau181, GFAP, and AB42/AB40. These participants also had more SIE on tests of proactive semantic interference. A combination of blood-based biomarkers the of ApoE ε4 positivity, p- tau181, and LASSI-L scores, correctly classified if an aMCI participant was Amy+/Amy- (82.0% accuracy rate). The combination of blood-based biomarkers and SIE, which represent deficits in semantic inhibitory control, exhibit high distinction when identifying positive or negative scores in amyloid PET imaging. These measures may show value in screening AD cases from controls during prodromal stages of the illness and offer promise in terms of their predictive utility.

1030. Becerra, A., Murphy, B., Puente, A., & Derenbecker, A. Wildly Discrepant NeuroQuant & Neuropsych Data: How Do We Explain This?

Brain matter volumes can be tested through magnetic resonance imaging (MRI) examinations using software such as NeuroQuant to provide sample-based calculations of normative percentile values. Neuropsychological examinations are the gold standard for measuring brain function; however, there is not always a perfect relationship between neuroimaging and neuropsychological data. Exploring these inconsistencies is critical to furthering our understanding of brain behavior relationships. This case study presents a right-handed White female in her early 60s with a doctorate degree from a premiere institution. The patient was successfully working and functionally intact, but had mild memory complaints. She was evaluated for these in our memory clinic and had unexpected NeuroQuant results given her clinical presentation. NeuroQuant results indicated cortical grey matter and hippocampi volume at the 1st percentile, cerebral white matter at the 2nd percentile, and cerebral white matter hypointensities at the 99th percentile. On her neuropsychological examination, the patient reported mild memory complaints, no work performance difficulties, and normal to exceptional test results. These results were very surprising given her NeuroQuant results. Possible explanations are discussed
Possible reasons that may explain the discrepancy between the patient's neuropsychological test scores and NeuroQuant results include: A) Cognitive reserve. B) NeuroQuant sampling and its possible inaccuracies. C) Active neuropathology but silent clinical symptoms. Implications of these findings suggest we need a greater understanding of the normative values and procedures used in NeuroQuant and further integration of other technologies to help our diagnostic precision of neurocognitive disorders (i.e. CSF, blood/plasma studies).


Clinical neuropsychologists performing serial assessments often rely on simple score differences (rather than reliable change methods) to identify cognitive change. This study sought to establish quick-reference normative criteria to identify how frequently significant change occurs across multiple cognitive measures in older adults. Data from 401 cognitively-normal older adults and 357 MCI participants were obtained from the Alzheimer's Disease Neuroimaging Initiative (ADNI). Change scores between baseline performance and 24-month follow-up were calculated for seven measures assessing four cognitive domains. The distribution of change scores was examined for each measure; participants whose change scores fell below the 5th percentile were classified as exhibiting substantial cognitive decline. 33.6% of MCI participants had at least one change score below the 5th percentile, in comparison to 24.9% of cognitively-normal participants. 10.6% of MCI participants had two or more change scores that fell below the 5th percentile, versus 4.2% of cognitively-normal participants. 3.9% of MCI participants had three or more change scores below the 5th percentile, versus 0.5% of the cognitively-normal participants. Among older adults assessed over two years with seven neuropsychological measures, it was not uncommon to have at least one or two change scores fall below the 5th percentile in the natural distribution of change scores. However, it was statistically rare to have three or more declines below the 5th percentile of change scores. This suggests that individuals who exhibit more multivariate changes in performance than these standards are likely experiencing an abnormal rate of cognitive decline.

1080. Bandel, L. & Kibby, M. Children with comorbid RD/ADHD exhibit cortical thinning in multiple regions compared to controls

Children with attention-deficit/hyperactivity disorder (ADHD) and reading disorder (RD) often demonstrate functional and structural brain differences compared to typically developing children, and many of these areas are associated with their cognitive weaknesses. Furthermore, research suggests these diagnoses are highly comorbid. However, limited research exists on cortical thickness in these conditions, particularly in the comorbid group. Thus, this study aimed to examine cortical thickness differences between children with comorbid RD/ADHD and controls. Participants included 47 children (8-12 years; 42.6% boys, 87.2% White). They completed an MRI scan and a neuropsychological battery as part of a larger, grant-funded study (R03HD048752, R15HD065627). A two-sample t-test was run in CAT12 software. Compared with controls, children with RD/ADHD demonstrated reduced cortical thickness in 3 large clusters in the left hemisphere and 7 clusters in the right hemisphere (p < 0.05; FWE corrected). These include several bilateral frontal, parietal, occipital, and temporal regions, along with the left insula. These regions are consistent with neuroimaging findings comparing children with ADHD-only or RD-only to controls, indicating children with comorbid RD/ADHD demonstrate cortical thinning in regions similar to those affected in children with ADHD or RD alone. Frontal-parietal networks are implicated in both disorders, as are occipital-temporal ones. Our results also are consistent with the
multiple deficit model of RD/ADHD, in that children with the comorbid condition were affected in areas similar to RD and ADHD alone, rather than being similar to only one or significantly different from both.


The locus coeruleus (LC) innervates the cerebrovasculature and supports cerebral perfusion, yet this phenomenon is not well-understood in humans. We examined relationships among LC integrity, regional perfusion, and cognition in older adults and examined moderating effects of plasma Alzheimer’s disease (AD) biomarkers. We hypothesized that greater LC integrity would support higher perfusion and better cognition and that plasma AD biomarker concentrations would moderate LC-perfusion relationships such that associations weaken in the presence of greater pathology. Dementia-free older adults (n=66) underwent structural/functional MRI to quantify regional perfusion and LC-MRI contrast. Subsets of participants underwent neuropsychological testing (n=36) and blood draw to measure plasma concentrations of Aβ42/40 ratio (n=56) and pTau181 (n=35). Multiple regression models examined relationships among regional perfusion, LC integrity, and cognition. Moderation analyses included additional terms for Aβ42/40 ratio, pTau181, and LC*biomarker interaction. Higher LC-MRI contrast was associated with higher frontal perfusion but lower limbic (e.g., amygdala, entorhinal) perfusion. Plasma-amyloid and plasma-tau concentrations significantly moderated LC-perfusion relationships such that higher pathology weakened LC-perfusion associations. Higher LC-MRI contrast was also associated with better episodic memory performance. This is the first human study to demonstrate associations between LC integrity and regional perfusion in older adults, and relationships were moderated by plasma AD biomarker concentrations. Our findings show how patterns of brain perfusion linked to LC structure may shift in response to growing AD pathology. LC integrity and cerebral perfusion should be further explored as potential preclinical dementia risk factors and considered when designing targeted therapeutics and interventions.

1464. Burley, C., Patel, S., Rabon, W., Collins, M., & Kontos, A. Utility of the Concussion Clinical Profiles Screening for Identifying Clinician-adjudicated Profiles

To determine which items from the Concussion Clinical Profiles Screening Tool (CP Screen) best identify each concussion clinical profile, as determined by clinicians. Method: Participants from a previous study (Kontos et al., 2020) included 278 (60.4% male) patients aged 9 to 51 (M=15.68, SD=3.93) within 30 days of injury (M=7.24, SD=5.88), who presented to a concussion specialty clinic between 2018 and 2020. All participants completed the CP Screen at their initial visit. The CP Screen is a 29-item self-report symptom inventory that measures five concussion clinical profiles (anxiety/mood, migraine, ocular, vestibular, cognitive/fatigue) and two modifiers (sleep, neck). Five backward logistic regressions (LR) were employed to determine which CP Screen items best identified patients who were adjudicated by clinicians to have each clinical profile. Results: 488 cases were analyzed as some participants presented with multiple clinical profiles. Four of five LR models met significance at p<.05 (range .003 to <.001). The anxiety/mood model (n=59) retained “feeling nervous” (OR 1.69) and “feeling more stressed than usual” (OR 2.30). The migraine model (n=177) retained “headache when you wake up” (OR 1.86). The ocular model (n=73) retained “headache with screen time” (OR .63), “trouble focusing eyes when reading” (OR 1.38), and “eye strain” (OR 1.62). The vestibular model (n=131) retained “dizziness with head movements” (OR 3.0). The cognitive/fatigue model (n=48) did not meet significance (p=.299). Conclusion: These results support the
utility of the CP Screen for identifying concussion clinical profiles. The findings also identify specific CP Screen items that best predict clinical profiles following concussion.


This study compared women survivors of intimate partner violence (IPV) with head injury (HI) due to IPV and due to reasons other than IPV on injury severity, subacute symptoms, and treatment received, hypothesizing that IPV would be related to greater HI severity, worse symptom sequelae, and lower access to care. Among 709 cisgender women with protective orders against male partners, 255 reported at least one HI due to IPV (M=33.8±9.0, range: 19-65; 87.5% White) and 118 reported no IPV-related HI, but at least one HI not due to IPV (M=32.2±9.1, range: 18-62; 89.0% White). Women were asked via face-to-face interviews about prior HI and symptoms within six months of HI and were compared based on whether any prior HI was due to IPV. Compared to women with non-IPV-related HI, women with IPV-related HI had a greater number of lifetime HIs (p<.001, r=.51) and more frequent loss of consciousness (p<.001, r=.27), but lower rates of post-HI hospitalization (p=.001, OR=2.20) and formal rehabilitation (p=.011, OR=3.18). Women with IPV-related HI reported all symptom sequelae at a higher rate than women with non-IPV-related HI (ps<.001), including physical (headaches: OR=3.15; dizziness: OR=2.65), cognitive (trouble problem solving: OR=2.66; inattention: OR=2.39), and affective symptoms (depression: OR=7.39; anxiety: OR=4.60). Among women survivors of IPV, those experiencing IPV-related HI reported greater subacute symptoms, but a lower likelihood of receiving care. Women with IPV-related HI represent an underserved population who are often unevaluated following injury and may have many unmet care needs.

1549. Trbovich, A., Sparto, P., Huppert, T., Elbin, RJ., Kissinger-Knox, A., Collins, M., & Kontos, A. Changes in Brain Activation Associated with Continuing to Play following Sport-related Concussion

Athletes who continue to play following sport-related concussion (SRC) have worse clinical outcomes including more pronounced neurocognitive impairments and longer recoveries, compared to those removed from play immediately postinjury. Researchers have yet to examine underlying brain activity associated with these clinical findings. This study examined brain activation (i.e., oxygenated hemoglobin concentration [HbO2]), using functional near-infrared spectroscopy (fNIRS), during an attentional task between athletes who continued to play (PLAYED) and those that were removed (REMOVED) following SRC. This was a prospective study of twenty athletes (10 PLAYED, 10 REMOVED) aged 12-18 (14.4±1.7) years injured within 7 (4.2±2.0) days. Differences in [HbO2] in brain regions of interest (ROI) at rest and during completion of the attentional task - Ruff 2&7- at initial post-injury clinic visit and clinical recovery were examined. A linear mixed effects model found the PLAYED group had increase in [HbO2] in the left hemisphere at the initial clinic visit (pFDR<.001) and the REMOVED group had reduction in [HbO2] in the right hemisphere at clinical recovery (pFDR=0.024). There was a significant group*timepoint interaction (pFDR<0.011) - the PLAYED group had greater increase in [HbO2] in the left hemisphere at the initial clinic visit compared with the REMOVED group, but no differences at clinical recovery. There was a significant main effect for time, with a greater increase in [HbO2] at the initial clinic visit compared to the clinical recovery time point (pFDR<0.040). Results suggest athletes who remain in play following SRC exhibit pronounced brain hyperactivation, which may underlie differences in clinical outcomes.
2086. Karr, J. Prevalence of Healthy Adults Meeting Possible and Probable Chronic Traumatic Encephalopathy Criteria

NINDS recently introduced new criteria for Traumatic Encephalopathy Syndrome (TES) to gauge certainty of Chronic Traumatic Encephalopathy (CTE) (Katz et al., 2021). Prior TES criteria (Montenigro et al., 2014) were criticized as non-specific, occurring among a substantial minority of the general population and other psychiatric or neurological disorders. The 2021 criteria were designed to improve the specificity of TES diagnosis. This study examined population base rates of 2014 and 2021 TES criteria in healthy community-dwelling adults. Participants consisted of healthy adults (n=835; M=48.1±18.2 years-old, range=18-85; 37.1% male; 64.1% White) without known history of neurotrauma or psychiatric or neurological conditions. The Montenigro (2014) and Katz (2021) criteria for TES/CTE were operationalized using the NIH Toolbox Cognition, Motor, and Emotion batteries and PROMIS-29. Results: Per Katz criteria, 36.9% had symptoms Suggestive of CTE, which required either Cognitive Impairment (20.1%) or Neurobehavioral Dysregulation (22.4%). The most common supportive feature was Psychiatric Features (31.5%; e.g., anxiety, depression). The requirement of Cognitive Impairment for Possible CTE certainty decreased the base rate of Possible CTE tenfold from Montenigro criteria (40.1%) to Katz criteria (4.1%). The requirement of Cognitive Impairment and three supportive features for Probable CTE led to an extremely low base rate of 0.8%. The Katz criteria were met less frequently by healthy adults than the Montenigro criteria. Requiring cognitive impairment and more supportive TES features when gauging CTE certainty may reduce false positive diagnoses. To assess specificity, future research should examine Katz criteria base rates in other psychiatric and neurological conditions.

2528. Rivera, R. & Benitez, D. Neuroscience of Subjective Tinnitus: Proposed Etiology

The purpose of this systematic review was to introduce a foundational hypothesis concerning the pathophysiology of subjective tinnitus and to define it as a neurological disorder. This review was conducted using the following databases: Science Direct, Google Scholar, and ProQuest Central. Inclusion criteria consisted of peer-reviewed articles published in English between the years 2010-2021. Keywords for the search included tinnitus, etiology, micro-infarct, auditory cortex, maladaptive plasticity, neuroplasticity, neurotransmission. Tinnitus, commonly known as “ringing in the ears,” is a phantom sound phenomenon that disrupts the quality of life of approximately 50 million individuals across the US (Henton & Tzounopoulos, 2021). Tinnitus is described as a heterogeneous condition in terms of presentation, etiology, and severity. Tinnitus is currently not well understood with many speculative etiological interpretations and with little to no effective forms of treatment in the field of medicine. It is theorized that tinnitus is caused by one or multiple micro-infarctions within the brain’s auditory cortex and that maladaptive plasticity plays a key role in the development of tinnitus as a symptom. This occurs within a scenario where neuroplasticity fails to make up for the lack of neural input from microscopic lesions of cellular death, thus disrupting the neuronal electrochemical flow (neurotransmission) between previously established neural pathways. This report provides substantial evidence for why the proposed hypothesis is sound, highlights the need to develop reliable diagnostics to verify its accuracy, and subsequently seeks to explore appropriate pharmacological and other interventions that may effectively provide relief to populations afflicted with this condition.


Amyotrophic lateral sclerosis (ALS) is an aggressive, terminal neurodegenerative disease with an average
survival time of three to four years. Despite being the most common motor neuron degenerative disease, current FDA-approved pharmacotherapies have demonstrated little efficacy in delaying disease progression and providing substantial clinical benefit. Furthermore, despite the psychological burden posed by ALS, interventions that target clinically significant psychological distress remain widely understudied and underdeveloped. Recent clinical trials demonstrating the efficacy of psychedelic (serotonin 5HT2A agonists) therapy for conditions like existential distress in life-threatening illnesses have led to a foray into its therapeutic potential. Additional findings on putative neurobiological and psychological mechanisms driving therapeutic change via psychedelic therapy have led clinicians to further investigate its efficacy for various neurodegenerative disorders. Results from clinical trials and mechanistic studies suggest psychedelic therapy may hold immense potential to serve as an effective, multifaceted, and enduring treatment for ALS psychomorbidity. While psychedelic therapy may also be implicated in ALS disease progression, further research is needed to understand this potential relationship. Ultimately, due to considerable gaps in the standard of care for ALS-related psychomorbidity, future research is strongly recommended to determine the safety, feasibility, and potential efficacy of psychedelic therapy for ALS.


Anecdotal reports have been published asserting that deep brain stimulation (DBS) results in unwanted personality changes with relatively limited empirical data. These negative narratives may dissuade patients from seeking out DBS and stigmatize patients with brain implants. A few studies empirically examined personality retrospectively using the Frontal Systems Behavior Scale (FRSBE) and Iowa Scales of Personality in patients with Parkinson's disease (PD). Group analyses revealed generally negative changes following DBS on executive dysfunction, disturbed social behavior, and virtually all subscales of the FRSBE based on patient and family reports. We prospectively investigated if DBS results in personality changes in 52 patients with PD recruited from a consecutive series of patients presenting for surgery. Participants were assessed with Now (i.e., current) scores on the FRSBE and Iowa Scales prior to surgery and at 6 and 12-months following implantation. We found significant decreases in Apathy based on family ratings following surgery on the FRSBE and significant reductions in the Distress subscale on the Iowa Scales. Our findings document improvements in apathy and emotional distress following DBS when changes are assessed prospectively. The discrepancy in our results relative to prior reports raises questions regarding the value of retrospective ratings which may be prone to bias in this sample. Our data can help DBS teams provide information on potential neurobehavioral changes following DBS, thereby improving the informed consent process. In addition, these data help refute some of the negative stereotypes evident in the academic and popular literature regarding personality change following DBS.

2817. Stuart, E., Torres, S., & Gutierrez, B. The effect of social skills therapy on social reality construction in children with social deficits

The research on social skills deficits tends to focus on how children with impaired social reasoning and functioning tend to have wide ranging issues in interpersonal communication. Despite three decades of research, no social intervention has looked at how social information affects perceptual capacities (such as the ability to recognise distance and size in visual perception). In this pilot study, two conservation tasks (size/distance and liquid) were given to 16 children with social deficiencies (such as Autism) before to a social skills group treatment session. Children completed the activity alone during the first
presentation, then with a different child from the group therapy session (PEERS Group). After at least 10 sessions of group therapy, the children redid the same task (alone or paired). It was hypothesized there would be significant improvements in perceptual processing in the children who worked in a pair for the conservation task after the therapy sessions, and this increase in processing would be significantly greater in the children who viewed the task alone after the group sessions. These improvements were hypothesized to be moderated by changes in social skills scores. This research suggests social skills training may also indirectly improve neurological processes involved in perception. Further research may wish to examine the exact mechanism of action through neuroimaging to see how these improvements are mediated by neurological processes.

2845. Elie, E. & Kristian, N. Associations between Self-Awareness and Executive Functioning in Acute Brain Injury Rehabilitation

Impaired self-awareness (ISA) in patients with traumatic brain injury can have negative implications for rehabilitation outcomes (Sherer & Nick, 2003; Dromer, Kheloudi, & Azouvi, 2021). Research examining associations between ISA and executive functioning has been inconsistent, and few studies have examined these relationships in inpatient rehabilitation settings (Hart et al, 2005; Newman et al., 2000, Bogod et al., 2003). Methodology: Archival data were used to examine associations between ISA and executive functioning among 57 TBI patients in an inpatient rehabilitation hospital. ISA was measured using the Awareness Questionnaire (AQ; Sherer et al., 1998). Executive functioning was assessed using the Trail Making Test, Delis-Kaplan Executive Function System Trail Making, Controlled Oral Word Association Test FAS and Animals, Wechsler Adult Intelligence Scale 4th Edition Digit Span, and Wisconsin Card Sort Test-64. Descriptive statistics were used for participant demographics. Correlational analyses were conducted using Pearson's r coefficients. Results: The study sample was young (mean age = 34.2, SD=16), and predominantly male (87.7%). Statistically significant correlations were observed between ISA and performances on the TMT B (r=-0.38, p<.05), WCST-64 (r=-0.33, p<.05), FAS (r=-0.35, p<.05), and Animals (r=-0.54, p<.01). This study reveals negative correlations between self-awareness and measures of cognitive flexibility and verbal fluency, which is consistent with other findings in post-acute rehabilitation. Executive dysfunction may lead to difficulties with accurate self-appraisals of current functioning, thereby undermining rehabilitation efforts, especially in the acute setting. Emphasis on interventions aimed to increase self-awareness at this stage may be helpful.

The current study examined the efficacy of an integrated cognitive and lifestyle intervention, Motivationally Enhanced Compensatory Cognitive Training (ME-CCT), compared to Goal-focused Supportive Contact (SC), in improving subjectively and objectively measured sleep and physical activity (PA) in older Veterans with MCI, and whether pain moderates this relationship. Seventy-four participants were randomized to receive 8 weekly, 2-hour manualized group sessions of either ME-CCT or SC (ClinicalTrials.gov identifier: NCT0322548). All participants completed self-report measures of sleep (Insomnia Severity Index), PA (Community Healthy Activities Model Program [CHAMPS] questionnaire), and pain intensity (PROMIS Pain Intensity Scale) at baseline, mid-treatment, and post-treatment. Daily step counts and total sleep time were also measured via Fitbits (n=25). Most participants (>80%) were White men, aged 55-90 (M=71, SD=7.9), with 14 years of education on average. Mixed-effects models demonstrated that, compared to the SC group, the ME-CCT group did not differentially improve on any measures of PA or sleep (ps>.05). However, pain significantly moderated treatment effects on objective sleep (t(37.93)=3.24, p=0.002), and had a trend-level moderation effect on objective PA (t(45)=-1.907, p=0.063). Specifically, objective average daily sleep time increased for only the ME-CCT participants with high baseline pain intensity (p=0.011) and SC participants with low baseline pain intensity (p=0.029). In contrast, PA levels increased only for ME-CCT participants with low baseline pain intensity (p=0.026). The current study underscores the utility of consumer wearables in the longitudinal assessment of behavioral functioning. ME-CCT warrants larger investigations to examine its efficacy in improving disease protective factors, along with cognition and functioning.

396. Sheth, A. & Bennett, C. Awe Walks Improve Quality of Life, Attention, Orientation, Mood & Social Behaviour in Dementia

Research has consistently shown decreased quality of life (QoL) in people with dementia, with predictors of QoL ranging from education to emotional status. This study investigated the impact of Awe Walks as an intervention targeting emotional status for the first time in dementia. Awe—a positive emotion elicited when in the presence of vast things not immediately understood—promotes social connection and fosters well-being by encouraging a “small self”. Participants with dementia between the ages of 60 and 85 took biweekly 15-min outdoor walks for 4 weeks; a total of 53 participants were matched and randomly assigned either to an awe walk group, which oriented them to experience awe during their walks, or to a waitlist control group. Pre- and post-intervention measures of QoL, cognitive functioning, behavioural pathology relevant to daily functioning, and clinical global impression were completed. Compared to degenerative deterioration in controls, individuals who participated in the Awe Walk intervention exhibited greater improvements in QoL, attention, orientation, mood, and social behaviour. These results suggest cultivating awe enhances positive emotions that improve quality of life and diminishes negative emotions that hasten decline. An intervention such as this, cost-effective and simply executed, has important implications for providing quality care to this population served by neuropsychologists.
Crawford, J., Murthy, P., Fein, D., & Yantz, C. A Case Study Surveying Decades of Alumni of a Model Clinical Neuropsychology Graduate Program

Recent research has surveyed postdoctoral and internship training directors on what they value in prospective clinical neuropsychology trainees. This study extends this by focusing on graduate school-level training in clinical neuropsychology. Psychologists who completed doctoral-level neuropsychology training provided objective and subjective outcome data regarding their experiences during and after their graduate years at a long-standing graduate program with specialty training in clinical neuropsychology. For our case study, the 191 graduates of University of Connecticut's Clinical Psychology doctoral program for whom the neuropsychology concentration was available were identified and contacted for participation. 44 alumni completed an anonymous online survey related to their current positions and activities as well as clinical neuropsychology training experiences during and after graduate school. Graduates of the program generally endorsed satisfaction in their graduate preparation in clinical neuropsychology as well as their current careers, and they have held a variety of positions with varying amounts of continued application of their graduate level training in clinical neuropsychology. All respondents expressed at least being “somewhat satisfied” and the majority endorsed being “very satisfied” with their current career activities. Current graduate programs and prospective trainees can compare their experiences with these data.

Curtis, K. & Singh, S. Observing cognitive and speech EMA in patients with Phenylketonuria paradigm

Phenylketonuria (PKU) is a rare disorder that causes the amino acid Phenylalanine (Phe) to build up in the body. PKU is an inherited disorder that, left untreated, can lead to intellectual disabilities, behavioral issues, or seizures. Patients with PKU tend to have fluctuations in cognition and speech, therefore, we aim to establish a hybrid model of care in which we examine changes in fluctuations as they relate to Phe levels and symptoms of PKU. There is a lack of previous research in understanding how best to treat individuals so that cognitive difficulties have less impact on a patient's daily functioning. With this information, we aim to demonstrate how fluctuations in cognition and speech relate to cognitive functioning in patients with PKU. The literature demonstrates that variability in Phe is a strong predictor of executive functioning and cognition (Hood et al., 2014). In addition to examining Phe levels, cognitive and speech ecological momentary assessment (EMA) are ideal methods for studying rare disease populations such as PKU because the collection of multiple data points from each participant can strongly detect clinically meaningful findings in patients’ everyday environments. We can use the methods we gain from this study to evaluate clinical samples and use EMA to look at other diseases that have natural fluctuations in cognition and speech. The results of this project could help providers gain more personalized insights into fluctuations in cognition, which can help with a better prediction of optimal cognitive efficacy and more tailored dietary and medication regimen recommendations.

Amirani, N. Can Deep Brain Stimulation Be a Promising Treatment for Treatment Resistant Depression?

Despite significant advances in antidepressant medication and somatic therapy in recent decades, such as electroconvulsive therapy (ECT), transcranial magnetic stimulation (TMS), and vagus nerve stimulation (VNS), 30% of patients with major depressive disorder remain untreated or are at high risk of relapsing. Deep brain stimulation (DBS) is a recently developed treatment modality that has been under investigation since 2005, and different research studies all over the world have investigated the effect of
this new kind of therapy from various aspects; however, the Food and Drug Administration (FDA) has not yet approved it as a final option in treating severe depression. In this study, the author tried, by reviewing the evidence-based articles on DBS effects on human depression, to reach a conclusion about whether DBS has the potential to be the ultimate treatment for depression. Reviewing the results of studying 446 patients who underwent DBS implantation demonstrated that DBS has the capability of treating severe major depressive disorder (MDD) or refractory depression as an adjunctive treatment if its weaknesses, including the lack of consensus on the DBS protocol and its stimulation parameters, the duration of treatment, the effect of a placebo, and the individualized pattern of depression, can be resolved through doing further highly controlled studies that compare the short-term and long-term effects.

878. Stanek, K., Park, Y., Weiss, D., Murro, A., & Vale, F. Processing Speed and Quality of Life in Temporal Lobe Epilepsy

This study aimed to better understand the relationship between epilepsy-related quality of life and cognitive slowing, which can be an early and meaningful impairment in people with temporal lobe epilepsy (TLE). Retrospective clinical data, including the WAIS-IV Processing Speed Index (PSI) and the Quality of Life in Epilepsy Inventory-89 (QOLIE), were examined along with measures of depressive symptomatology (Beck Depression Inventory-2) and epilepsy-related clinical variables for 78 patients (age M = 37.27, SD = 11.84) with medically refractory TLE. Bivariate correlation and hierarchical linear regression models were used to assess relationships between study variables and determine whether processing speed had an independent effect on quality of life. Significant positive correlations were found between PSI and the QOLIE total score (r = .24, p < .05) as well as several QOLIE subscales. As expected, QOLIE scales were significantly associated with depressive symptoms; however, PSI was not significantly correlated with depressive symptoms, epilepsy duration, or number of antiepileptic medications. While PSI did not significantly add to the prediction of the QOLIE total score after accounting for depression in regression analyses, there was a significant independent effect of PSI on several QOLIE subscales. While further research in larger samples and with multiple measures of processing speed is indicated, the current results support prior research suggesting the importance of both cognitive and psychological factors in epilepsy-related quality of life and also more specifically highlight the clinical relevance of slowed processing speed in this population.

1333. Finley, J-C & Brook, M. Development of an Over-Reporting Index for the WHODAS Understanding and Communication Subscale

The WHO Disability Assessment Scale is a well-validated and widely used self-report measure of perceived disability. The Understanding and Communication (WHODAS-UC) subscale specifically assesses perceived cognitive impairment. This study investigated whether a cut-score on the WHODAS-UC subscale can be used to index the validity of cognitive symptom reporting. Our sample comprised 131 adults who underwent comprehensive outpatient neuropsychological evaluations, divided into three groups: those who produced extremely high scores on validated measures of symptom over-reporting (i.e., MMPI F scale, PAI NIM scale); those with invalid cognitive test performance as determined by using well-accepted practice criteria, and those determined to have valid symptom reporting and test performance. Analyses revealed that scores ≥21 on the WHODAS-UC subscale successfully discriminated between patients who exaggerated symptoms on the MMPI / PAI and those who did not (AUC = .79; specificity = .91). Less than 10% of participants with valid symptom reporting were misclassified as having invalid symptom reporting based on this cut-score. Conversely, WHODAS-UC scores did not
successfully discriminate between patients with valid versus invalid cognitive test performance (AUC = .58). These findings provide preliminary evidence of convergent validity for the WHODAS-UC subscale as an embedded index of cognitive symptom over-reporting. Findings are also consistent with prior research suggesting caution in using self-report measures to guide clinical judgement regarding performance validity.

1404. Wolff, B., Franco, V., Magiati, I., Cooper, M., Roberts, R., & Glasson, E., Wellbeing of siblings of individuals with neurodevelopmental conditions: risk and resilience factors

Siblings of individuals with neurodevelopmental conditions (NDCs) are exposed to unique family environments and experience a range of psychological and cognitive risk factors influencing their mental health. Networks of risk, resilience, and neuropsychiatric variables were estimated for siblings of individuals with (n=235) and without (n=480) NDCs (N=277, mean age 22.40 years, 76% female, 74% White Caucasian) who completed self-report measures online. The NDC group had significantly higher scale-based depression (g = 0.39) and anxiety (g = 0.43) than controls, and 71.5% of the NDC group reported at least one neuropsychiatric diagnosis compared to 36.9% of controls. There was high prevalence of self-reported sleep and post-traumatic stress disorders amongst NDC siblings, two conditions widely accepted to maintain and exacerbate other mental health and cognitive problems across the lifespan. Using network analysis, everyday executive functioning (specifically, cognitive inflexibility and hyperactivity/impulsivity) and emotion dysregulation were the most influential transdiagnostic risk factors within the NDC group network, while self-esteem was central to the control group network. Conditional inference tree analysis indicated these networks were robust to demographic variation within and between groups, although weak effects (i.e., poorer functioning) were observed for participants whose parents had divorced or separated, and participants who were gender diverse. Findings indicated NDC siblings have densely connected, dynamic risk variables mutually reinforcing psychopathology, and provided key avenues for further longitudinal research to address early identification and support for at-risk siblings.

1451. Ramsey, T., Assaly, O., Yancey, E., Prevost, K., & Williams, J. Implementing Neurotechnology in Assessment: Benefits and Barriers

Clinical neuropsychology has an opportunity to expand the competency and availability of services with the use of neurotechnology as brain disorder prevalence increases (Hessen, 2017). This poster aims to highlight the concerns, feasibility, and limitations of integrating neurotechnology during assessments. Literature between 2002 and 2022 was obtained by searching keywords such as neurotechnology on Google Scholar or PubMed. Selected articles were reviewed based on relevance to the objective and themes were clustered. Since the increase in neurotechnology utilization during Covid-19, concerns about test security, testing distractions, demographic/language barriers, insurance/reimbursement, and accessibility to reliable technology have risen (Hammers et al., 2020; Parsons et al., 2021). Computerized testing also raised financial concerns from publishing companies and neuropsychologists (Miller & Barr, 2017). However, neurotechnology was found to be accepted by clinicians and clients. Neurotechnology can allow for data not accessible with typical measures (Parsons et al., 2021). Telehealth test scores do not significantly differ from on-site testing (Brearly et al., 2017). Ecological validity and continued assessment outside of the testing room can occur with devices/software (Campbell et al., 2020; Miller & Barr, 2017). One of the biggest barriers to providing neuropsychological services to those who need them is geographical limitations and neurotechnology offers a way to serve them (Temple et al., 2002). Moreover, the literature supported the feasibility of using neurotechnology in practice. However, many
barriers still need to be addressed to competently implement neurotechnology into assessments. Future research should analyze multi-modal assessments, digital measure translation, and ongoing assessments beyond the feedback session.


Use of cognitive screeners (e.g., MoCA, SLUMS, MMSE) alone may result in over-pathologizing cognitive impairment and lead to inappropriate diagnoses, subsequent treatment, and life changes. Impaired performance may occur due to several non-cognitive factors (e.g., mental health diagnoses, substance use, pain, impaired sleep, poor effort). This study evaluated the relationship between scores on cognitive screeners administered by hospital staff, performance on neuropsychological testing, and subsequent diagnosis. Retrospective data based on chart review was collected from adults who completed comprehensive neuropsychological evaluation in an outpatient clinic at a Southern Veterans hospital (n = 112; age M = 74.96, SD = 6.50; 69.67% Caucasian; 95.08% males; education M = 12.74, SD = 2.95). The DRS-2 positively correlated with the MMSE (r = .66, p < .01) and the MoCA (r = .64, p < .01). Screeners did not correlate with the RBANS or Geriatric Depression Scale (GDS). Despite a positive correlation, screener scores were either at chance level (MMSE: 49% at 22/30) in predicting final dementia diagnosis or required very poor performance (MoCA: 16/30) to obtain 77% accuracy of predicting a dementia diagnosis based on comprehensive evaluation. Diagnosis of neurocognitive disorders should not be made based on screener performance due to their poor predictive ability and lack of comprehensive understanding of factors that may have impacted screener performance. Dissemination of these results may assist providers in appropriate use and understanding of cognitive screeners, improved diagnostic accuracy, and reduced false positive rates of cognitive disorders.

1947. Shamji, J., Miller, J., & Jenkins, S. Executive Functions as Predictors of Theory of Mind in Undergraduate Students

Many mental disorders are characterized by troubles with executive function (EF), which includes skills such as sustained attention, inhibition, cognitive flexibility, working memory (WM), and more. Another feature of psychological dysfunction is the ability or lack thereof to see a situation from another's perspective, also referred to as Theory of Mind (ToM). A ToM task, Strange Stories (SS), tests abilities in comprehending persuasion, white lies, misunderstandings, and the like. We controlled for and examined the effect of demographics, along with simple and complex EF functioning on SS performance. The sample (N=119) came from an ethnically diverse (MSI) public university campus. After controlling for demographic variables and attention/inhibition (simple EF), we hypothesized that both WM and cognitive flexibility (complex EF) would significantly predict SS performance. Participants completed multiple performance validity tests to measure EF (Visual Search Task, Go/No Go Task, N-Back Task, Task Switching) as well as ToM tasks which included SS. A hierarchical multiple regression examined whether working memory and cognitive flexibility predicted SS. English fluency and sibling presence were added as controls in Step 1, followed by attention/inhibition in Step 2, and WM/cognitive flexibility in Step 3. The overall model was significant (R2=.27, F(3, 118)=6.20, p=<.001). In Step 3, English fluency, WM, and cognitive flexibility were significant predictors of SS performance variability (English: B=1.27, p=.011; WM: B=0.68, p=.004; Cognitive flexibility: B=0.47, p=.046). In conclusion, both English fluency and complex EF skills significantly predicted SS performance variability.
Trisomy 12p is a rare anomaly occurring in approximately 1 in 50,000 births. In addition to dysmorphic facial features and cardiovascular conditions, common manifestations of this disorder include intellectual disability. However, limited research is available exploring the neuropsychological correlates of this disorder, which can ultimately support improved overall outcomes. This study aims to add to this effort by examining the neuropsychological profile of a 16-year-old female with mosaic trisomy 12p, who further presents with a history of global developmental delay, atrial septal defect, and multiple head injuries. The patient was referred for an Independent Educational Evaluation to understand her neurocognitive profile and identify appropriate academic placement. Cognitive testing revealed impaired intellectual and adaptive functioning warranting an Intellectual Disability diagnosis. Visual motor coordination and language deficits were consistent with her history of global delays. Substantial attentional weaknesses further warranted a diagnosis of an Other Specified ADHD. Sub-clinical anxiety complicated her presentation. Relative cognitive strengths were seen in her verbal reasoning capacity when expressive language demands remained low, and in her age-appropriate abstract visual memory and contextual auditory-verbal memory. Findings support extant literature regarding the preponderance of impaired intellectual functioning in individuals with trisomy 12p, and further highlight the heterogeneity of neurodevelopmental disorders within this population. Specific interventions and accommodations were recommended in-line with neuropsychological findings. However, further research is warranted to better understand and address the unique needs of this population and explore the implications of co-occurring biological and environmental factors.

The purpose of this study was to explore the utility of neuropsychological testing for patients with Posterior Cortical Atrophy as well as provide an appreciation for the role neuropsychologists play in multidisciplinary teams. Patient A is a 55-year-old, right-handed, Caucasian man who was referred for a neuropsychological evaluation due to concerns related to her cognitive functioning. More specifically, the patient expressed concern regarding cognitive decline in the context of visual deficits and peripheral vision loss. All background information was obtained from a clinical interview with patient A and a review of all available medical records. Data suggested that the patient is evidencing difficulties in his cognitive functioning that are greater than what would be expected due to normal age-related decline and appear more global than visual spatial deficits alone. Current test results noted general global decline with aspects of language relatively less impacted. His prominent visual spatial perception deficits are atypical of Alzheimer's disease but are clearly indicative of a dementing process at present. Neuroimaging has ruled out cerebrovascular accident, neoplasm, or other structural abnormalities affecting his vision and global cognitive functioning. A potential consideration of etiology that impacts the dorsal visual system, does not involve significant motor symptoms, and leads to cognitive decline with intact awareness of difficulties is posterior cortical atrophy (PCA). This diagnosis can be better determined by serial neuroimaging over time as well as potentially using functional neuroimaging techniques like PET scans and the patient should follow-up with neurology.

The ability-focused approach to neuropsychological assessment calls for the development of domain-
specific performance validity tests (PVTs). This study investigated the viability and utility of five measures of executive functioning (Stroop Word, Color, and Color-Word; Trail Making Test A and B) as embedded performance validity indicators (EVIs). Our sample comprised 286 adults undergoing an outpatient neuropsychological evaluation. Participants were divided into groups with invalid (n=22) versus valid (n=264) performance as determined by clinicians’ judgement and scores on freestanding PVTs. We first conducted ROC curve analyses to empirically determine the cut-scores from each of the five measures that could differentiate validly and invalidly preforming groups with at least 90% specificity. Resulting cut-scores evidenced moderate classification accuracy with AUCs ranging from .64–.69 for the five EVIs. We next used logistic regression to investigate the predictive power of each measure individually and in combination. The EVIs from Stroop Word and Stroop Color subtests accounted for the greatest proportion of the variance in performance validity status (Wald>3.22; p<.01), with the other three measures contributing a negligible amount of unique variance to the model. Requiring failure on both Stroop Word and Stroop Color EVIs resulted in only a modest improvement in overall classification accuracy (specificity=0.93; AUC=0.75). Requiring failure of all five EVIs did not improve overall classification accuracy (specificity=0.90; AUC=0.73). These findings suggest that cut-scores on common measures of executive functioning may be successfully deployed as domain-specific EVIs. Findings also suggest that chaining multiple within-domain EVIs may not result in improved detection of invalid performance.