

\$2,000 Jay Gunkelman Scholarly Research Award Presented to: Ross Spears, Whitney Rich & Greg Cummins SPECIAL WEAPONS AND TACTICS: EXAMINING COLLECTED QEEGS FOR THE ASSESSMENT AND MENTAL HEALTH IMPLICATIONS OF SWAT PERSONNEL



### **Ross Spears:**

Ross Spears is a Visiting Assistant Professor at the University of Texas at San Antonio (UTSA). He recently graduated with his PhD in Counselor Education and Supervision from UTSA this past summer. For his dissertation, Ross developed student neurofeedback learning competencies for counseling departments interested in integrating neurofeedback courses to their graduate programs. His research interests include neurofeedback, cultural humility, and creative teaching and learning modalities. In conjunction with teaching, Ross currently provides neurofeedback and counseling services to the San Antonio community.



# Whitney Rich:

Whitney Rich is a second-year doctoral student studying Counselor Education and Supervision at the University of Texas at San Antonio. She is a previous graduate assistant for UTSA's Introduction to Neurofeedback course and a current officer of UTSA's Neurofeedback Society. Her research interests include mindfulness-based relaxation techniques, group counseling, multicultural counseling competencies, and utilizing neurofeedback in counseling. She is particularly interested in helping make counseling more accessible to traditionally non-help seeking communities.



# **Greg Cummins**

Greg Cummins is a graduate student at the University of Texas at San Antonio (UTSA) pursuing a degree in Clinical Mental Health Counseling. He also holds a Master's of Public Administration from UTSA and currently serves as Vice President of the UTSA Neurofeedback Society. In conjunction with taking graduate-level counseling courses, Greg is an active member of San Antonio's Special Weapons and Tactics (SWAT) team. He assists with a variety of high-risk situations that allow for an intimate understanding of the needs and concerns of law enforcement officers. Greg's is currently enrolled in UTSA's advanced neurofeedback course with the intention of pursuing BCIA certification. His research interests include assessment, PTSD, mindfulness, and full body wellness.



**\$2,000 Jay Gunkelman Scholarly Research Award** Presented to Caylie Hadden

THE EFFECTS OF NEUROFEEDBACK AMONG INDIVIDUALS WITH TRAUMA



# Caylie Hadden:

Caylie Hadden recently graduated from Western Kentucky University (WKU) with a Bachelor's degree in Psychology. While attending WKU, she worked as a research assistant to Dr. Sugjin Im in the Transitional Neuroscience Laboratory. While here, her work focused on the effects of Neurofeedback as a treatment for Post Traumatic Stress Disorder. She hopes to continue her education by gaining her Master's in Clinical Psychology, specializing in Post Traumatic Stress Disorder.



### \$1,000 IQCB Scholarly Research Award Presented to Gabriela Mariana Marcu

Adolescents with complex childhood trauma from residential homes in Romania: Searching for neuromarkers and neurofeedback protocol



### Gabriela Mariana Marcu

Gabriela Mariana Marcu is a clinical psychologist and PhD student in Physiology and Neurosciences at the "Carol Davila" University of Medicine and Pharmacy Bucharest. She is currently working as Scientific Researcher III within the Neurosciences Scientific Research Collective of the Hospital Clinic of Psychiatry "Dr. Gheorghe Preda" Sibiu, Laboratory of Psychophysiology and Clinical Neuropsychology. She is also a lecturer in the Psychology Department of the Lucian Blaga University of Sibiu.

She was a visiting researcher at the Human Information Processing Lab of the Faculty of Psychology in Tampere (Finland)

and improved her clinical practice in neurofeedback in Germany (IFEN Neuroscience) and Denmark (EEGTraining, Aarhus). Gabriela is particularly interested in interdisciplinary, collaborative and "open science" research, conducting studies on subjects such as: complex childhood trauma in adolescents, functional neuromarkers for psychopathology (QEEG, ERP), the effectiveness of neuroregulation therapies (e.g. neurofeedback) in psychiatry, human decision-making and prosocial behavior. She is a member of the International Society for Neuroregulation (ISNR) and the International Organization of Psychophysiology.



**\$1,000 IQCB Scholarly Research Award** Presented to Noely Y. Ramos-Vega

SLORETA NEUROFEEDBACK FOR BRAIN AND BEHAVIORAL DISREGULATION ON A STROKE PATIENT: A CASE STUDY



### Noely Y. Ramos-Vega

Noely Y. Ramos-Vega is a driven and passionate psychologist and PhD Clinical Psychology student at Ponce Health Science University in Puerto Rico. Noely has a master's degree in counseling psychology and is licensed in the field. Her academic journey is focused on expanding her expertise and making significant contributions to the field and the betterment of society.

Her research interests lie in neurorehabilitation, neuropsychology, and the intersection of these fields with grief, traumatic brain injury (TBI), strokes, and hard to treat mental health conditions that could benefit from neurofeedback (NFB). Noely has developed a growing interest in

NFB and quantitative electroencephalography (QEEG). Her commitment to utilizing innovative methodologies reflects her eagerness to contribute to the advancement of psychological research. She has participated in research endeavors, centered around women's psychology, neuropsychological assessment, and the application of NFB based interventions.

Fortunate to receive guidance and mentorship from esteemed Dr. Castillo-Reyes, Noely has had the opportunity to refine her research skills, expand her theoretical knowledge, and gain practical experience in the clinical and research settings. This mentorship has played a vital role in shaping her career trajectory, fostering her growth as a researcher and clinician.

With her dedication, passion, and strong foundation in clinical psychology, Noely aims to make a lasting impact in the field through NFB and QEEG interventions. She envisions a future where her research findings can be translated into practical applications that benefit the lives of individuals from all walks of life. Noely's relentless pursuit of knowledge and commitment to empowering others through her work are a center piece of who she is as a person. As she continues her journey, her goal is to contribute significantly to the advancement of research and the betterment of mental health in her community.

### Special Weapons and Tactics: Examining Collected QEEGs for the Assessment and Mental Health Implications of SWAT personnel

**PRESENTED BY:** Ross Spears, Master of Science, Whitney Rich, Master of Science, & Greg Cummins, Masters of Public Administration- University of Texas at San Antonio **SUPERVISOR:** Mark Jones, PhD

### This presentation DOES NOT qualify for APA CE credits

**Abstract:** Members of law enforcement working in the community encounter a variety of trauma-related experiences (Bishopp et al., 2019). Known as occupational stressors, these events range from conflict resolution between community members to crime and violence (Eddy et al., 2019; Soomro & Yanos, 2018). Study findings continue to illustrate that occupational stressors increase the onset of physical and psychological consequences (Wild et al., 2016). If left unattended, Law enforcement workers experience the negative symptoms of stress (Bishopp et al., 2019) and an overall decrease in health (Rajaratnam et al., 2011). Special Weapons and Tactics (SWAT) teams function as a more niche group within law enforcement and navigate situations mandating more trained and focused care such as hostage negotiations and other high-risk encounters (Avdija, 2014). Engaging in events that not only require heightened vigilance (Callaway et al., 2011) but perpetuate the exposure to harmful outcomes may exacerbate the onset of negative mental health symptoms (Papazoglou & Tuttle, 2018).

Quantitative electroencephalogram (qEEG), is a computerized process that synthesizes and analyzes raw EEG data. Researchers advocate that qEEGs are useful in recognizing diagnoses including depression (Olbrich & Arns, 2013), post-traumatic stress disorder (PTSD), and anxiety (Bandelow et al., 2017). For instance, Van der Kolk (2014) states that individuals with a PTSD diagnosis typically demonstrate a combination of excessive activity in the right temporal lobe combined with frontal slow-wave activity (p.325). This biomarker suggests that mental functioning is inhibited due to hyperarousal of the fear center of the brain.

Mental health professionals who utilize qEEG recordings are uniquely positioned to assist with the law enforcement population. By considering both engrained cultural safeguards surrounding mental health and integrating qEEG-guided interventions (e.g., neurofeedback) can help populations subjected to traumatic and difficult events. This presentation will articulate common barriers faced by law enforcement personnel seeking out mental health services, as well as provide preliminary evidence findings of qEEG recordings performed on members of a SWAT team. The purpose of this presentation is to continue the ongoing dialogue discussing interventions that address the psychological needs of law enforcement individuals.

### Learning Objectives:

Based on the content of the presentation, the participant will be able to distinguish at least five factors of occupational and organizational stressors among the law enforcement population.

Based on the content of the presentation, the participant will be able to identify at least two barriers impeding law enforcement personnel from seeking out mental health services. Based on the content of the presentation, the participant will be informed of at least three major themes and findings found in the presenters' current research involving the qEEG recordings of SWAT team members.

# **THE EFFECTS OF NEUROFEEDBACK AMONG INDIVIDUALS WITH TRAUMA PRESENTED BY:** Caylie Hadden, BA - <u>https://www.wku.edu/</u>, Sungjin Im, Ph.D **SUPERVISOR:** Im Sungjin, PhD https://www.wku.edu/

**Abstract:** Post-Traumatic Stress Disorder (PTSD) is a psychological disorder followed by witnessing or experiencing a traumatic event. Symptoms may include severe flashbacks, memories, or psychological/physical reactions, which cause significant distress and interfere with someone's everyday life. Electroencephalographic (EEG) Biofeedback, also referred to as Neurofeedback is an emerging treatment for Post-Traumatic Stress Disorder. This form of treatment can be used to treat brain wave dysregulation which is often associated with post-traumatic stress disorder. Neurofeedback is an experimental approach that aims to regulate brain waves via operant conditioning, targeting the symptoms of Post-Traumatic Stress Disorder. This study aims to evaluate the effects of neurofeedback training as a treatment for Post-Traumatic Stress Disorder symptoms. This case study consisted of five participants who coded positive for PTSD per the MINI Neuropsychiatric Interview module for Post-Traumatic Stress Disorder, (including four females and one male ranging from 18-21 years of age). Participants completed 3 assessments, including pre-, mid-, and post-treatment, and 10 Z-score neurofeedback sessions. Assessments included a 10-minute eyes-open task and a 10-minute eyes-closed task monitored by an EEG, two cognitive tasks, and a combination of three self-report surveys administered via the Qualtrics system. Participants completed NF sessions twice a week, each lasting 20 minutes, with electrode sites assigned to F3, F4, P3, and P4. The results suggest that neurofeedback training offers beneficial effects regarding Post-Traumatic Stress Disorder and other comorbid symptoms. Conclusively, three out of five participants reported a significant reduction in Post-Traumatic Stress Disorder symptoms varying between intrusive thoughts, avoidant behaviors, hyperarousal, and mood. Two out of five participants reported a significant reduction in anxiety and depression, while two other participants reported a small to moderate reduction in anxiety. While the preliminary empirical evidence appears promising, further research with a larger sample size, an active control group, and an increased number of sessions is warranted.

### Learning Objectives:

The purpose of this research study is to evaluate.

The acceptability and feasibility of neurofeedback training for individuals with post-traumatic stress disorder (PTSD).

### Adolescents with complex childhood trauma from residential homes in Romania: Searching for neuromarkers and neurofeedback protocol

**PRESENTED BY:** Gabriela Mariana Marcu, Ph.D Candidate - <u>https://umfcd.ro/</u>, Ana Maria Zăgrean, Professor- <u>https://umfcd.ro/</u>, & Ainat Rogel, PhD, MSW, LICSW, BCN - <u>https://www.bostonneurodynamics.com/</u>

#### SUPERVISOR: Ainat Rogel, PhD

**Abstract:** Adolescents in residential homes are one of the most disadvantaged populations: they were removed from their biological families and suffer from childhood complex trauma, which compromises the development of the frontal lobes, that peaks during adolescence. The adolescents in Romanian residential homes have little chance to get adopted, as they do not receive treatment to improve their functionality, and their education level is low. All these adolescents have complex childhood trauma (also named developmental trauma) which should be considered when treating them.

Although research has shown that neurofeedback significantly reduces PTSD symptoms and improves executive functioning in adults and children (Gapen et al., 2016; Hong & Park, 2022; Rogel et al., 2020; van der Kolk et al., 2016), results show that symptoms are reduced and not eliminated. Besides, to our knowledge, there is a lack of controlled studies to investigate the efficacy of neurofeedback in adolescents in general, and in those in residential homes specifically.

This study is a first step in developing a comprehensive approach for these adolescents by (1) raising awareness that their complex childhood trauma is associated with their current situation and proposing a treatment modality to directly address the neurological development, by (2) proposing the most effective neurofeedback (NF) protocol as a treatment for enhancing their executive functioning and reducing their PTSD symptoms, and (3) identify neurological objective measurements and neuromarkers to develop the most effective NF treatment and to assess the impact of NF treatment.

We propose a two-stage study: • (S1) Stage 1: exploratory, with the aim of finding markers (EEG, qEEG, ERP, physiological and behavioral) for adolescents with complex childhood trauma. • (S2) Stage 2: a three-group random-control, assessor-blinded, clinical trial. Forty-eight adolescents (12-17yo) will be randomized to either NF-S (standard T4-P4), individual NF (qEEG based) or WL (waitlist, control) group, and will complete 4 assessments (including follow-up).

Following the study, identified markers (neural, physiological, and behavioral) will be proposed to the research community to further testing, in association with complex childhood trauma. Also, the study's results may help to guide the recommended NF protocol for adolescents who are currently in complex childhood trauma programs. In addition, follow-up assessments would inform about the stability of the significant achievements. Based on the obtained results, an intervention program will be recommended in the residential homes, and guidelines and recommendations for personnel and people preparing to adopt will be produced. Given that there are no resources allocated in Romania for the treatment of children in residential homes, there is a big need for support interventions aiming at raising their functionality and reducing their vulnerability.

The comparison of standard protocols with individual protocols (i.e. qEEG-guided) can bring valuable insights into the most beneficial NF approach to complex childhood trauma. The research will thus contribute in long term to (1) the development of a treatment framework for adolescents with complex childhood trauma (2) the international efforts of developing a discipline of childhood trauma.

### Learning Objectives:

Recognize and get interested in the complex childhood trauma markers in adolescents. Develop ideas upon different neurofeedback modalities efficacy in complex childhood trauma treatment.

Discuss the impact of the expected study's results.

### SLORETA NEUROFEEDBACK FOR BRAIN AND BEHAVIORAL DYSREGULATION IN A STROKE PATIENT: A CASE STUDY

**PRESENTED BY:** Noely Ramos-Vega, MS - Ponce Health Science University, Ismael Castillo-Reyes, Ph.D - University of Puerto Rico,Estate Sokhadze, Ph.D. - Duke University

#### SUPERVISOR: Estate Sokhadze, PhD

Abstract: Epidemiological data has positioned stroke as the second leading cause of death worldwide. Of 15 million people that suffer from a stroke yearly, approximately 6 million die and 5 million become chronically disabled. Stroke is the fifth leading cause of death and the first cause of long-term disability in Puerto Rico. Cognitive and motor impairments are highly prevalent and persistent in stroke survivors. Network disruptions caused by a stroke event on brain regions implicated in the different aspects of motor function and cognition can significantly impact quality of life. Targeting both focal cortical tissue damage and non-focal global changes in brain function should be considered when developing therapeutic strategies to improve brain responses, recovery rate, and the quality of life of brain injury survivors. In this regard, using QEEG-guided Low-Resolution Electromagnetic Tomography Analysis (LORETA) Z-Score neurofeedback (NFB) is a promising approach that has been reported to be effective for stroke and TBI rehabilitation as it targets dysregulation in networks in deep cortical locations. Being able to train these deeper structures in the brain is a major leap forward in brain mapping as connections between networks or regions can be trained, increasing the efficiency of brain networks specifically related to a patient's symptoms. The main goal of this study was to explore the effects of QEEG-guided Z-score LORETA NFB (LZLNB) in the optimization of behavioral performance and brain electrophysiological activity in a 57-year-old male who suffered a stroke in the central/right part of the parietal lobe (severe speech difficulties due to apraxia, left hemiparesis, and intense headaches were presented). The study used a pre-experimental design with pre-post comparison. To this end, LZNFB was applied to affected brain areas for 25 sessions. Baseline and posttreatment measurements were made on QEEG metrics, Event-related potentials at Pz (oddball paradigm), attention, memory, executive function, reaction time, and cognitive flexibility. Behavioral improvements were found in executive function, cognitive flexibility, processing speed, and reaction time after 25 sessions of LZNFB on computerized tasks (at the postmeasurement, the patient could complete the tasks with both hands). Significant changes were found on lower frequencies and connectivity variables across all brain areas, as observed in the QEEG Z-score maps. Greater discrimination and less latency for auditory stimulus were also found on P300 ERP component analysis at Pz after the intervention (pre-latency = 430ms, post-latency = 360ms). In addition, significantly improved speech, mood, and motor function were also observed in session #6. These findings suggest the potential effectiveness of LZNFB on cognitive performance improvement among stroke sufferers. Further studies with a larger number of patients and control groups may be required to evaluate the full potential of this type of training in stroke patients.

#### Learning Objectives:

Learn how neurofeedback can be used in post-stroke rehabilitation.