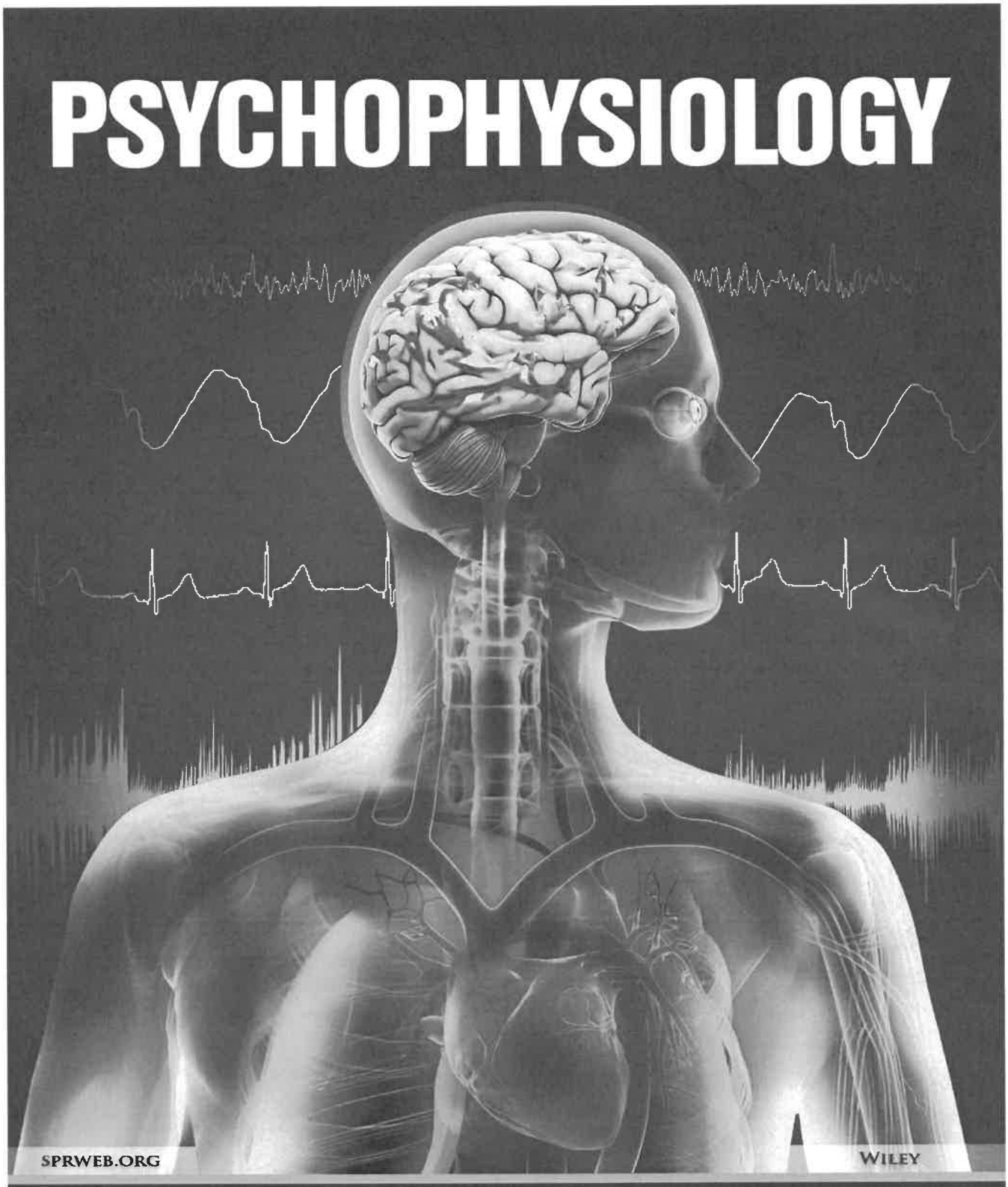
PSYCHOPHYSIOLOGY



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THE INTERNATIONAL JOURNAL OF THE
SOCIETY FOR PSYCHOPHYSIOLOGICAL RESEARCH

PSYCHOPHYSIOLOGY

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VOLUME 55 ■ 2018 ■ SUPPLEMENT 1

Fifty-Eighth Annual Meeting of the Society for Psychophysiological Research

Quebec City Convention Centre, Quebec City, Quebec, Canada
October 3-7, 2018
Website: www.sprweb.org

The 2018 Annual Meeting Program includes three Pre-Conference Workshops, three Invited Addresses, Symposia, and the SPR Presidential Address. Specific research topics will be covered in the Symposia. The majority of the research reports will be discussed at four Poster Sessions.
This Supplement contains the abstracts from each presentation in the Symposia and Poster Sessions. The abstracts are listed in the order in which they will occur at the Annual Meeting.
All authors are listed in the Index to Abstract Authors. In addition, abstract topics are listed in the Index to Abstract Descriptors.
We would like to thank all contributors for sharing their research and making this meeting a rich and stimulating event!
Anna Weinberg
2018 Program Committee Chair

Pre-Conference Workshops

Tuesday, October 2, 2018
10:00 a.m.-4:30 p.m.
Pre-Conference Workshop #1
MINI ERP BOOT CAMP
Emily S. Kappenman, San Diego State University

Wednesday, October 3, 2018
9:00 a.m.-4:30 p.m.
Pre-Conference Workshop #1
MINI ERP BOOT CAMP (continued)

9:00 a.m.-4:30 p.m.
Pre-Conference Workshop #2
MULTILEVEL MODELING
Elizabeth Page-Gould, University of Toronto

9:00 a.m.-4:30 p.m.
Pre-Conference Workshop #3
MACHINE LEARNING FOR NEUROIMAGING DATA: BUILDING AND USING PREDICTIVE MODELS
Leila Wehbe, Carnegie Mellon University

5:00 p.m.–7:00 p.m.
Special Symposium
OPEN SCIENCE: FROM PRE-REGISTRATION TO REPLICATION TO DATA SHARING

Invited Addresses

Thursday, October 4, 2018
10: 45 a.m.-11:45 a.m.
Invited Address
NEUROBIOLOGY OF INFANT ATTACHMENT: WHY DO THE ABUSED ATTACH?
Regina Sullivan, PhD
Professor, Child and Adolescent Psychiatry, Nathan Kline Institute, Department of Child and Adolescent Psychiatry, New York University Langone Medical Center

Friday, October 5, 2018
10:30 a.m.-11:30 a.m.
Invited Address
TOWARD A MECHANISTIC UNDERSTANDING OF TERRA INCOGNITA: THE HUMAN SUBCORTEX
Birte Forstmann, PhD
Professor for Cognitive Neurosciences, University of Amsterdam

4:40 p.m.-5:40 p.m.
Invited Address
NEURAL SIGNATURES OF RISK FOR MENTAL ILLNESS
Ahmad R. Hariri, PhD
Professor of Psychology and Neuroscience, Laboratory of NeuroGenetics (LoNG), Duke University

Saturday, October 6, 2018
10:30 a.m.-11:00 a.m.
Early Career Award Address
THE ERRING BRAIN: ERROR-RELATED BRAIN ACTIVITY AS A RISK-MARKER FOR PSYCHOPATHOLOGY
Anja Riesel, PhD, Humboldt University

11:00 a.m.-11:30 a.m.
Early Career Award Address
EEG AS A THEORETICAL AND METHODOLOGICAL HUB FOR THE NEURAL SCIENCES
James Cavanagh, PhD, University of New Mexico

11:30 a.m.-12:30 p.m.
Presidential Address
WHEN WORDS ARE BINDING: PREDICTION AND ATTENTION IN LANGUAGE COMPREHENSION
Kara D. Federmeier
Professor, Department of Psychology, Program in Neuroscience, and the Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign

Poster 1-091

RETHINKING DEVELOPMENTAL DIFFERENCES IN THE REWARD-RELATED POSITIVITY

Kreshnik Burani[1], Brady Nelson[2], Greg Hajcak[1]
[1]Florida State University, [2]Stony Brook University

Descriptors: Reward-related Positivity, Development, Adolescents

Developmental research on the Reward-related Positivity (RewP) has produced mixed findings, with some, but not all, studies reporting a potentiated RewP during adolescence. The mixed results may reflect methodological differences in how the RewP is scored. The current study examined developmental effects on the RewP in a large and longitudinal sample of 317 adolescent females between the ages of 8 to 14 who were assessed at two time points, separated by two years. To elicit the RewP, subjects completed a simple monetary reward (i.e., Doors) task. The RewP was measured as the ERP difference between gain and loss trials. The current study utilized two scoring approaches: first, the mean amplitude of the RewP was measured between 250-350 ms following feedback; second, to account for between-subject latency jitter, the 100 ms area around the peak of the difference (AAPD) waveform was calculated. Cross-sectional correlations at baseline revealed small but significant relationship between the RewP and age, such that the RewP was larger for older subjects. However, the strength of the relationship depended on the scoring approach—the correlation with age was larger using mean amplitude compared to AAPD. At time 2, cross sectional correlations revealed no age-related effects. Longitudinal analyses revealed a significant increase in the RewP, but only using mean amplitude. Collectively, the results suggest that developmental increases in the RewP may reflect between-subject latency jitter that is eliminated when AAPD measures are utilized.

Poster 1-092

SHIELDING CHIPS REDUCE EFFECTS OF ELECTROMAGNETIC FIELD EXPOSURE ON EEG BRAIN ACTIVITY IN THE CAR

Diana Henz
University of Mainz

Descriptors: Electromagnetic Fields, Car Driving, Electromagnetic Shielding Chips

Several studies have demonstrated negative effects of electromagnetic field (EMF) exposure on EEG brain activity and cognitive performance. We investigated whether EMF shielding chips that are applied in the car reduce effects of EMF exposure in the car on brain activity, heart rate variability (HRV), and electromyographic (EMG) activity. Participants were tested either in a control car or in a car that was prepared with EMF shielding chips. Measurements were taken in both car conditions under different EMF exposures (engine, air condition, bluetooth mobile call, WiFi). Spontaneous EEG brain activity was recorded by high-density EEG from 128 electrodes before, during, and after each experimental condition. EMF emission was recorded continuously during all EEG measurements. Participants reported significantly more discomfort (nervousness, headache) with increased EMF emission. Results showed increased beta and gamma activity in frontal and temporal regions under EMF exposure with most increases in the bluetooth mobile call and WiFi condition in the control car compared to the prepared car. Data of source localization showed that brain activity was not superficial but involved large portions of the frontal and temporal lobes. Heart rate variability (LF/HF ratio) decreased, EMG activity increased with higher EMF emission. Results indicate that EMFs induced physiological changes that have adverse effects on the psychophysiological state, attentional performance, and metabolism of the brain during car driving. Application of EMF shielding chips help to reduce these effects.

Poster 1-093

EFFECTS OF UNILATERAL DYNAMIC HAND GRIP ON BRAIN OSCILLATORY ACTIVITY IN RANGE OF 8-12 HZ: A REPLICATION STUDY

Arash Mirifar[1], Fernando Villasana[2], Felix Ehrlenspiel[1], Jürgen Beckmann[1]
[1]Technische Universität München, [2]University Hospital Ludwig Maximilians Universität-München

Descriptors: Embodiment Intervention, Body and Mind Intervention

Previous studies have linked hand muscle contractions with changes in hemispheric asymmetric activity within the 8-12Hz range. However, debate continues regarding the state of asymmetry induced after unilateral contractions. We examined the potential effects of unilateral hand contractions on oscillatory brain activity during and after hand execution. Participants (N=22 right-handed, 17 female) with a mean age of 25 years were recruited. The study adopted a within-subjects design which consisted of a pre- and post-test (2 min rest condition; eyes open) and intervention (hand contraction; at the participants own pace, at an approximate rate of two times a second, for 45 seconds, while keeping the other hand on their matching thigh with the palm facing down) for each hand. The result during contractions showed a significant bilateral decrease in alpha amplitudes (8-12 Hz) for both hands in and around sensory-motor regions. Following contractions, an increase in alpha amplitudes above baseline was observed over the whole scalp, greater after left- than right-hand squeezing. These findings replicate our earlier study and are at odds with previous reports which suggested greater relative activation in electrodes contralateral to the active hand. The currently observed increase in alpha amplitude can be used to develop targeted interventions aimed modifying behavioral outcomes which are affected by alpha activity.

Poster 1-094

LATENT CLASS GROWTH ANALYSIS, ELECTROMYOGRAPHY, AND HETEROGENEITY IN FEAR LEARNING: METHODOLOGICAL CONSIDERATIONS AND THEORETICAL IMPLICATIONS

Michael Lewis, Russell Jones, Alisa Huskey, Maia Reyes, Cassie Van Orden, Bruce Friedman
Virginia Polytechnic and State University

Descriptors: Learning, Electromyography, Methodology

Most fear learning studies use central tendency statistics. Thus, individual differences in fear learning within heterogeneous populations are understudied. Growth Mixture Modeling (GMM) methods such as Latent Class Growth Analysis (LCGA) are uniquely suited for examining these individual differences, but only one extant study has utilized GMM to examine fear learning in humans. The present study employed LCGA to examine heterogeneity in trajectories of fear acquisition and extinction in a sample of undergraduates (n = 67). Fear was indexed via fear potentiated startle (FPS); FPS was indexed using electromyography (EMG) to capture reflexive eyeblinks. This study used a discriminant learning paradigm to examine conditioning in response to a CS+ and a CS-. Model fit indices indicate that 12.4% of the sample acquired fear to the CS+, evidenced by increasing FPS during acquisition (slope = 5.96, $p < .001$), but 87.6% of the sample did not (slope = -.08; $p = .183$). The acquiring group evidenced decreasing FPS during extinction, but this was not significant at the $p = .05$ level (slope = -.43; $p = .22$). A one class solution best fit the data for the CS-, indicating homogeneity in FPS to the CS- with no acquiring group (slope = .015; $p = .98$). Overall, results suggest that LCGA may be a promising methodology for examining heterogeneity in fear acquisition, though large samples may be needed to capture differences in extinction, due to the small percentage of participants acquiring the fear. Methodological considerations and theoretical implications are discussed.