

to the severity of the psychopathological symptoms but, interestingly, appeared to be less impaired in first-episode patients.

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STATISTICAL PROCESSING OF FACIAL ELECTROMYOGRAPHY (EMG) SIGNALS IN EMOTIONAL FILM SCENES

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Descriptors: emotion, EMG, statistical parameters

To improve human-computer interaction, computers need to recognize and respond properly to their users' emotional state. As a first step to such systems, we investigated how emotional experiences are expressed in various statistical parameters of facial EMG signals. 22 Subjects were presented with 8 emotional film fragments while a TMS Portilab system was used to measure the activity of frontalis above the left eye (EMG1), right corrugator supercilii (EMG2), and left zygomaticus major (EMG3). Additionally, subjects rated the intensity of both their positive and negative feelings for each film. Based on average positive and negative ratings, films were classified into 4 emotion categories (with 2 films each): Mixed, Neutral, Positive, and Negative. From each EMG signal, 6 statistical parameters were derived: mean, absolute deviation, standard deviation, variance, skewness and kurtosis. For each of the resulting 18 parameters, a REMANOVA was conducted, with the 4 emotions and 2 films as within-subject factors. The effect of emotion was significant for EMG2 skewness ($F(3,18) = 3.500$, $p = 0.037$), EMG3 mean ($F(3,18) = 9.711$, $p < 0.001$), EMG3 absolute deviation ($F(3,18) = 8.369$, $p < 0.001$), EMG3 standard deviation ($F(3,18) = 5.837$, $p = 0.006$) and EMG3 variance ($F(3,18) = 4.064$, $p = 0.023$). Thus, only few of the EMG parameters reached significance, possibly because—mimicking a potential human-computer situation—we did not correct our data for baseline values and averaged over a period as long as 120s. Nevertheless, the EMG3 signal remains promising in its differentiation among emotion categories.

NONCONSCIOUS COMPETITION PRIMING MODULATES FACIAL REACTIONS TO AVATAR EMOTIONAL FACES

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Descriptors: facial expression, EMG, subliminal

To investigate whether a subliminally primed competition goal influences facial reactions to facial emotional displays, 49 participants were either subliminally competition primed or neutrally primed. In the priming procedure words (e.g. rival, opponent for competition condition; street, background for neutral condition) were presented parafoveally for 90 milliseconds and immediately covered by a letter string. The priming itself was covered as reaction time task. Thereafter, participants viewed computer generated avatar faces with happy, neutral and sad expressions while M. Corrugator supercilii and M. Zygomaticus major reactions were recorded electromyographically. Whereas congruent facial muscular reactions to both happy and sad expressions were expected for the neutrally primed condition, subliminal competition priming was expected to reduce these reactions. As expected, results revealed congruent M. Corrugator supercilii and M. Zygomaticus major reactions to happy and sad faces in the neutrally primed group. Furthermore, subliminal competition priming enhanced M. Corrugator supercilii activity after an initial relaxation while viewing the happy faces. In addition, competition primed participants showed a trend to react with M. Zygomaticus major activity to sad faces. An impression formation task revealed counter empathic effects and therefore confirmed successful competition priming. Overall, results indicate that nonconscious processes influence nonverbal behavior and social perception.

REDUCED PPI DURING STRESS IN PTSD

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Descriptors: prepulse inhibition, anxiety disorders, stress

Although reduced PPI has been found in Vietnam veterans with PTSD under both baseline and stressor conditions (Grillon et al., 1996; Grillon et al., 1998), recent research has failed to find reduced PPI in non-combat PTSD subjects under baseline conditions (Lipschitz et al., 2005). This research assessed PPI at 3 lead intervals in 9 subjects with non-combat PTSD and 11 low-trauma control subjects during baseline and stressor conditions (oral mental arithmetic). In a repeated measures ANOVA with independent variables of condition, lead interval and group, a 3-way interaction qualified main effects of condition (stress reduced PPI) and lead interval (greatest PPI reduction at 120 ms). The interaction revealed that PPI did not differ between groups during baseline, but during stress, subjects with PTSD showed reduced PPI compared to controls at a 120 ms lead interval, but not at 60 ms or 240 ms lead intervals. During stress, the 120 ms lead interval PPI correlated with a subset of PTSD symptoms (avoidance-numbing), showing reduced PPI with increasing symptoms. Both total PTSD symptoms and a second subscale, re-experiencing symptoms, also were elevated with reduced PPI and also only at 120 ms lead intervals and only during stress. These preliminary results suggest that for non-combat PTSD, baseline PPI does not differ from controls but that during stress PPI may be reduced at specific lead intervals. Future research can assess if specific symptoms such as numbing and re-experiencing are associated with reduced PPI in subclinical populations as well as in PTSD.

THE NEUROANATOMICAL BASIS OF TEMPERAMENT IN EARLY ADOLESCENTS

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Descriptors: temperament, adolescence, MRI

We investigated the relationship between four core temperament dimensions evident during early adolescence (Effortful Control, Negative Affectivity, Affiliation, and Surgency), and brain structure in a sample of 155 12 to 13 year olds. Participants were selected from a larger sample ($n = 2500$) that completed the Early Adolescent Temperament Questionnaire (Revised). MRIs were performed on a 3T scanner using a 3D volumetric sequence and images were transferred to an SGI / Linux workstation where morphometric analyses were performed. Key regions of interest (ROI), including limbic and paralimbic areas of the ventral, rostral, and dorsal anterior cingulate cortex (ACC), amygdala, hippocampus, and orbitofrontal cortex (OFC), were manually defined and quantified. Analyses examined the relationship between each temperament dimension and ROI volumes, controlling for whole brain volume, gender, and handedness. Effortful Control (a dimension describing the capacity to plan, focus and shift attention, and suppress inappropriate responses) was associated with larger volumes of the left amygdala and hippocampus, left dorsal paralimbic ACC and left and right OFC. Negative Affectivity (frustration to goal-blocking) was associated with smaller volume of the left dorsal paralimbic ACC. Affiliation (the desire for warmth and closeness with others) was associated with smaller whole brain and left ventral limbic ACC volumes, and larger right rostral limbic ACC. The present findings suggest that temperament dimensions in healthy early adolescents can be linked to neural substrates.

QUALITATIVE DIFFERENCES IN N400 BETWEEN HIGH-CLOZE IDIOMS AND LITERAL SENTENCES

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Descriptors: language, N400, ERP

Few studies have examined idiom processing electrophysiologically, though many studies have made use of highly familiar idioms as a means of manipulating