Artifacts sets of data; sad, neutral, and

Life, Emotions

Artifacts and eye-blinks as detected by the EMGelectrodes will be removed by using several filters such as bandpass and notchfilters in BrainVision Analyzer 2.

1 and Matlab R2015a. The EMG data will beanalyzed using a 500 ms pre-stimulus baseline correction. Then the data will besegmented according to the stimulus categories to three sets of data; sad, neutral, and happy condition. For the preprocessingpurposes of the EMG data Matlab R2015a will be used.

More specifically, thedata will be automatically cleaned (i. e. automated artifact rejection) byrejecting the individual trials within the subject where any of the muscles hadan activity higher or lower than five standard deviations above or below themean. We will define the outliers and exclude them from the further analyses asin representing an activity higher or lower than two standard deviations aboveor below the mean after collapsing all the data both across subjects and acrossconditions. All remaining sets will consist of baseline corrected data (i.

e. computedpercentage change scores) averaged over the whole 2000 ms time window; over thefirst 1000 ms and over the second 1000 ms. For the statistical analyses, IBM SPSSStatistics 20 will be used. Furthermore, EMG data will be analyzed in repeated-measuresANOVAs with the inclusion of all the subjects (condition x muscle xattachment/impulsivity) with condition (happy, sad, and neutral) and muscle(zygomaticus major and corrugator supercilii) serving as within-group factorsand attachment/impulsivity (attachment style/high and low impulsivity) as thebetween-group factor. The

analysis of theattachment style will be performed at each level of processing, i. e. rapidfacial mimicry and delayed facial mimicry, whereas the analysis for the degreeof impulsivity for the whole time-window.

A significant interaction found in anANOVA (condition x muscle), including all subjects, if in the expecteddirection, will be interpreted as a mimicking reaction. The expected directionsare an increase in activity of the zygomaticus major upon exposure to the happyfacial expression compared with exposure to the sad facial expression, and anincrease in activity of the corrugator supercilii upon exposure to the sad facialexpression compared with exposure to the happy facial expression. There should beno specific EMG activation in response to the neutral facial expression. The project, in general, has its background inpsychology but also relies on knowledge of neuroscience and physiology whileusing EMG methodology. The possible neural correlate of facial mimicry could bethe mirror neuron system (MNS). There are a couple of functions attributed tothe MNS in humans; motor goals, imitation, and empathizing with others(Bastiaansen, Thioux, & Keysers, 2009).

The term MNS suggests adefinite degree of specificity. It supposedly enables us to map observedbehavior onto our own neural substrates for these same specific actions, sensations, or emotions (Bastiaansenet al., 2009). Furthermore, MNS also plays an important role in socialcognition (Agnew, Bhakoo, & Puri, 2007). An important question to be raisedconcerns itself with the consequences in clinical populations where socialcognitive deficits represent the core symptomatic.

For example, autism spectrumdisorder (ASD) is characterized by deficits in imitation, empathy, theory of mind, and pragmatic language (Frith, 1989). Here, mirror neuron activation is reduced (Oberman et al., 2005). On theother hand, attention-deficit/hyperactivity disorder (ADHD) is characterized byinattention, hyperactivity, andimpulsivity (Faraone & Biederman, 2005). With that being said, thepsychiatry perspective comes into account. Furthermore, individuals withattachment-related difficulties in infancy tend to exhibit a higher level ofpsychopathology in adulthood (Dozier et al., 2008). Identifying suchindividuals by assessing their attachment orientation is an important tool.

Forexample, individuals with an insecure attachment orientation are also moreoften diagnosed with a variety of mental disorders (e. g., Dozier et al., 2008).

Mymaster’s thesis also extends from a 3rd person perspective byacquiring the EMG data to the 1st person perspective by assessingself-report measurements (e. g., BIS-11, ASQ). 1. 0 EXPECTEDRESULTSThis master’s thesis project is the continuation of aprevious pilot study investigating facial mimicry of emotional facialexpressions (happy and sad conditions) and its modulation by attachment and impulsivity. According to the pilot study andprevious studies, we expect to see an increased activation of the zygomaticusmajor muscle and a decreased activation of the corrugator supercilii musclewhile observing others’ happy facial expressions, whereas observing others’ sadfacial expressions should elicit the opposite pattern of activation. Inaddition, we expect no specific EMG activation in response to

neutral facialexpressions. We anticipate thatindividuals with a secure attachment style, low scores on both avoidance andanxiety, will demonstrate aforementioned typical levels of facial mimicry; i.

e. they will represent a baseline to which insecure individuals can be compared. Dismissing individuals with a positiveself-image and negative other-image (low in attachment anxiety and highin attachment avoidance) will show a similar level of mimicry to secureindividuals at the automatic level, whereas at the cognitively controlled levelof processing they will mimic happy facial expressions more and sad facialexpressions less than secure individuals. On the other hand, preoccupiedindividuals (low attachment avoidance and high anxiety) have a negative imageof the self and positive of the other people (i. e. they seek acceptance andvalidation from other people).

They will mimic similarly to those with a secureattachment style but more exaggerated at both levels of processing. Fearful attachmentorientation represents individuals that doubt about self and others (highattachment avoidance and high anxiety), and avoid personal contacts with otherpeople. We expect them to mimic the least compared to the other attachmentorientations. Finally, we will form two groups of high and lowimpulsive individuals by a median split on the BIS-11 score. Impulsive symptoms could be the direct or the indirect consequence of emotiondysregulation or attempts of modulating intense emotional reactions (Linehan, 1993). Emotion dysregulation, with its primary role in the development andmaintenance of psychopathology and mental disorders

(Gross, 1998), inborderline personality disorder (BPD) consists of greater emotional sensitivity(Domes, Schulze, & Herpertz, 2009), greater emotional reactivity whereamygdalar activity is increased (Donegan et al.

, 2003), and a return tobaseline arousal is slower (Linehan, Bohus, & Lynch, 2007). Therefore, we expect that high impulsive individuals will mimic more than low impulsiveindividuals.