Covert processing of emotion-inducing words among alexithymics: An event-related potentials (ERPs) study

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Several studies suggest that different personality traits, such as anxiety or depression, generate an attentional bias (1). Alexithymia, a subclinical phenomena marked by a cluster of impairments in emotional awareness and expressiveness, is another dimension that could affect attentional processes to emotional stimuli. Indeed, using a modified version of the Stroop colour-naming task, alexithymics (Alx) were found to have longer RTs to emotion-inducing stimuli than non-alexithymics (Nlx) (2). To investigate this further, we designed an S1-S2 ERP visual probe-detecting task to assess if alexithymia is associated with an attentional bias to emotion-inducing words. P300 and Contingent Negative Variation (CNV) amplitudes were considered to index cognitive responses to the emotional stimuli. Non depressed, non-anxious, right-handed females with low versus high stable alexithymia scores (TAS) were selected from an initial sample of 350 students (13 Nlx; 12 Alx). The probe-detection task was based on Titchener's Law of Prior Entry (3) that states that an attended stimulus will appear to occur sooner than a physically simultaneous but unattended stimulus. The S1 were four types of word pairs: negative-neutral, positive-neutral, negative-positive, neutral-neutral. The S2 were pairs of coloured bars, displayed in the exact location previously occupied by the word pairs. The S1's were presented during 950ms. The S2's started at S1 offset and were presented for 800ms. The inter-stimulus (S1-S1) interval was fixed at 3500ms. Participants were required to decide, and respond as fast as possible, which of the two coloured bars occurred first. The one that was reported to occur first indicates which of the two words the subject was attending. The EEG was recorded from 29 equidistant electrodes according to the international 10-20 system. The ERPs were averaged according to the type of word processed by the subjects (e.g., in the negative-neutral condition, all the trials for which the subjects selected the coloured bar corresponding to the negative words were averaged and compared to all the trials for which the subjects selected the coloured bar corresponding to the neutral words) (StatMap+, InStep). After the scanning session, subjects performed a free recall task, a retrieval task, and ranged the emotional valence of a list of words including the target words. The results suggested that whereas behavioural indices of emotional information processing do not distinguish the two groups, ERP components, more specifically the P300 and CNV, associated with the presentation of emotional words, are differently modulated in the Alx in comparison to the Nlx. In the experimental conditions where negative words were displayed, enhanced P300 amplitudes and reduced CNV mean amplitudes were observed in the Alx in comparison to the Nlx. These were found predominantly at parieto-occipital sites. The usefulness of the ERP technique to study cognitive style and emotional information processing in alexithymia will be discussed.

References
3. Titchener E.B. Lectures on the elementary psychology of feeling and attention. The MacMillan Company, New York, 1908