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Alexithymia factors and memory performances for neutral and emotional words

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ABSTRACT

Alexithymia is a multifaceted personality construct, which includes difficulties in identifying and expressing feelings and an externally-oriented cognitive style. We investigated the effects of alexithymia and its subscales on recall and recognition rates for neutral, joy, disgust and anger words. We found that the alexithymia-factor difficulties identifying feelings was negatively associated with memory performance for emotion words whereas a positive association was found between the alexithymia factor externally-oriented cognitive style and recognition rates for all words (emotional and neutral). The deficit for difficulties identifying feelings was particularly strong for remember responses. Such a deficit in the ability to consciously recognize emotional concepts could be related to the observed difficulties in regulating intense feelings found in high alexithymia scorers.

1. Introduction

Alexithymia is a multifaceted construct that includes difficulties in identifying and expressing feelings, a reduced capacity to engage in fantasy and other imaginal activities, and a stimulus-bound, externally-oriented cognitive style (Taylor, Bagby, & Parker, 1997). Empirical findings have shown that high alexithymia scorers report lower intensity of emotional responses at the cognitive/experiential level to an emotional visual stimulus (e.g., lower reports of emotional appraisals; Luminet, Rime, Bagby, & Taylor, 2004). Some studies have demonstrated that participants scoring high in alexithymia show deficits in anger processing (Vermeulen, Luminet, Cordovil de Sousa, & Campanella, 2008; Vermeulen, Luminet, & Corneille, 2006). At a neurophysiological level, some Event-Related Potential (ERP) findings have revealed that high alexithymia scorers can correctly perceive and categorize aversive pictures but that they need more cognitive resources to do so (Franz, Schaefer, Schneider, Sitte, & Bachor, 2004).

For Taylor et al. (1997), high alexithymia scorers are often unable to link feelings with memories. Therefore, understanding how alexithymia moderates memory performances is an important step to better understand how this construct disrupts emotional processing. Some research has started to investigate memory performance in alexithymia but contrasting findings have been obtained. Indeed, whereas some studies have found a deficit in memory for emotional stimuli in alexithymia (i.e., Luminet, Vermeulen, Demaret, Bagby, & Taylor, 2006; Montreuil & Pedinielli, 1995; Suslow, Kersting, & Arolt, 2003), other studies have failed to find an effect of alexithymia (Jacob & Hautekeete, 1998; Lundh, Johnsson, Sundqvist, & Olsson, 2002, Study 1).

It has been proposed that some methodological differences and shortcomings could account for such contrasting results (Luminet et al., 2006). For instance, Lundh and colleagues (2002) studied episodic memory by measuring response latencies whereas Luminet et al. (2006) studied semantic memory by scoring recall rates in a depth-of-processing manipulation. Importantly, an alternative explanation was proposed for the results of Luminet et al. (2006). The authors posited that higher alexithymia scorers rated emotion words as less emotional than lower alexithymia scorers. Therefore, the way people initially appraised the words could explain the poorer performance of high alexithymia scorers. Also in Luminet et al. (2006), there was a floor effect in the shallow condition (4.6% of recalled words). Finally, previous studies only compared neutral to positive and negative material without paying attention to discrete emotions and particularly anger. Therefore, further studies are needed in order to assess such memory performance in alexithymia.

The main aim of the present study is to investigate whether the memory for different types of emotion is moderated by alexithymia level. We decided to introduce four different discrete emotional states such as neutral, joy, disgust and anger. As was done in Luminet et al. (2006), we used the level of processing (LOP) paradigm (Craik & Tulving, 1975). In the LOP paradigm, stimuli are processed either in a shallow way that focuses on the physical features of the stimuli (e.g., size of font), or in a deep way in which the meaning of the stimuli must be processed to adequately complete the task (e.g., adequacy of a word in a sentence).

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In order to avoid a floor effect, we decided to use another shallow condition which enhanced memory performance (Craik & Tulving, 1975, Experiment 5). We also decided to use a deep task in which participants had to evaluate the emotional meaning of the words (Niedenthal, Winkielman, Mondillon, & Vermeulen, in press). This procedure ought to be better adapted to alexithymia since it forces participants to access emotional meaning of the words in order to answer. Moreover, we decided to use the Remember/Know procedure which is proposed to operationally define autonoetic (self-knowing) and noetic (knowing) consciousness during retrieval of information (Gardiner, 1988; Tulving, 1985). The "Know" responses, produced by noetic consciousness, reflect this feeling of knowing that a stimulus has been presented before. The "Remember" responses indicate that participants could consciously recollect some aspects of what was experienced at the time the stimuli were presented (e.g., what one was thinking at the time of encoding) (Gardiner, 1988).

We hypothesized that participants would recall and recognize more words in the deep (semantic) vs. shallow (perceptual) processing condition (Craik & Tulving, 1975). It was also predicted that the participants would recall and recognize more emotion words than neutral words (e.g., Ferré, 2003). Based on previous findings (e.g., Luminet et al., 2006), we hypothesized that alexithymia would moderate the overall retention of emotional words but not of neutral words. Moreover, based on previous findings showing a deficit in anger processing in alexithymia (e.g., Vermeulen et al., 2006, 2008), we expected a stronger moderating impact of alexithymia on memory performance for anger words. We also chose to contrast anger words with positive emotion words (i.e., joy) and another high arousal negative emotion (i.e., disgust).

Regarding the differential effects of the three factors, as proposed by Suslow et al. (2003), we suggest that the factor "difficulty in identifying feelings" (DIF) and the factor "difficulty in describing feelings" (DDF) would be associated with poor memory performance for emotional words. Inversely, the cognitive factor "externally-oriented cognitive style" (EOT) of alexithymia would be less or not at all related to memory performance for emotional words. Based on Luminet et al. (2006), we hypothesize that these effects should be particularly marked for the "Remember" but not for the know level of consciousness.

2. Method

2.1. Participants and design

Sixty-five volunteers (54 women, mean age = 19.20 years, SD = 2.20) from the Université catholique de Louvain (Belgium) participated in fulfilment of a course requirement. The present experiment conformed to a 2 (level of processing: perceptual vs. semantic) × 4 (Type of emotion words: Neutral vs. Joy vs. Disgust vs. Anger) design, with level of processing as a between subject factor and valence of words as a within-subject factor. As is now recommended, we investigated the moderating impact of personality variables (Alexithymia, Positive and Negative State-Affectivity and State-Anxiety) using a continuous approach (Cohen, Cohen, West, & Aiken, 2003).

2.2. Material

Forty-eight words were selected from the 120 French words pretested by Niedenthal et al. (in press) on a discrete emotion (joy, anger and disgust) scale from 1 "not related at all" to 5 "highly related to." Twenty-four words were emotion-related, with eight words related to each of the three emotion concepts "joy" (e.g., smile, baby, happy), "disgust" (e.g., excrement, vomit, nauseous), and "anger" (e.g., fight, enraged, furious). Twenty-four words were unrelated to any emotion concept (e.g., substantive, quantified, chair, cube). Niedenthal et al. (in press) found that their 20 joy words were judged as more related to joy ($M = 4.49$; SD = .25) than to anger ($M = 1.13$; SD = .13) or disgust ($M = 1.08$; SD = .09). The 20 anger words were judged as more related to anger ($M = 4.20$; SD = .54) than to joy ($M = 1.05$; SD = .04) or disgust ($M = 3.05$; SD = .74). The 20 disgust words were judged as more related to disgust ($M = 4.18$; SD = .47) than to joy ($M = 1.08$; SD = .08) or anger ($M = 2.32$; SD = .52). Finally the 60 neutral words were judged as neither related to joy ($M = 1.77$; SD = .29), nor anger ($M = 1.32$; SD = .17) nor disgust ($M = 1.34$; SD = .19). In a post-test, we asked 23 new participants (21 women; mean age 19.78; SD = .80) to assess the 48 target words for arousal on a scale ranging from 1 "relaxing, calm" to 7 "stimulating, activating". There was a main effect of words, $F(3, 20) = 68.21$, $p < .001$ with angry words ($M = 6.39$, SE = .12) judged as more arousing than all the other words (all $ps < .001$), disgust words ($M = 5.34$, SE = .14) were rated as more arousing ($p < .001$) than joy words ($M = 3.16$, SE = .27) and neutral words ($M = 3.49$, SE = .16). Neutral words and joy words did not differ from each other ($p > .20$).

2.3. Procedure

Stimuli were presented using E-Prime 1.1.4.1 on a 17-inch color monitor. Participants assigned to the "shallow" task were instructed to indicate whether a pattern of "C" for consonant and "V" for vowel matched the letters sequence of a word (e.g., CVCCVC for the word CANCER). The remaining participants performed the "deep" task, in which they had to indicate whether the referent of each word was related to an emotion or not. In order to ensure for a constant intensity of processing across participants, half of the words presented required a "yes" answer ("S" key press) and the other half a "no" answer ("L" key press). The "S"/"L" response position was counterbalanced across participants and conditions.

After processing the list of items at the assigned level, participants had to unexpectedly list the words they could recall. They were then presented with a recognition task in which the forty-eight encoded words were intermixed with twenty-four new neutral words and eight new words related to each of the three emotion concepts. In this recognition task, participants had to indicate whether the recognition was associated with a "Remember" or a "know" state of consciousness or if it was simply a "guess". Following Luminet et al. (2006), a "Remember" response was defined as having a specific memory of the time the word appeared on the screen like having a particular image or thought associated to the word. A "Know" response was defined as knowing that a word was part of the list showed on the screen but without the retrieval of more details. "Guess" answers are situations in which people think it was plausible that the word was presented but without any degree of certainty (Gardiner, 1988; Tulving, 1985).

2.4. Measures

2.4.1. Toronto Alexithymia Scale (TAS-20)

The TAS-20 is the most widely used measure of the alexithymia construct (Bagby, Parker, & Taylor, 1994a; Bagby, Taylor, & Parker, 1994b). It is comprised of 20 items that are rated on 5-point Likert scales ranging from 1 "strongly disagree" to 5 "strongly agree". The items load on three factors – difficulty identifying feelings (DIF); difficulty describing feelings (DDF); and externally oriented thinking (EOT). The present study used a validated French translation of the scale (Loas, Parker, Otmani, Verrier, & Fremaux, 1997). Total scores ranged from 20 to 100 points. Cronbach's Alpha of this scale in the present study was .79, which is quite similar to previously found Cronbach's Alpha (.78 in Vermeulen, Corneille, & Luminet,