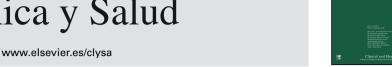# Clínica y Salud

Cognitive processes in evaluation anxiety: An experimental study based on memory bias

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ABSTRACT

The present article presents the data from an experimental research with the primary goal of exploring the presence of memory bias in participants with high levels of evaluation anxiety in comparison with a group with low evaluation anxiety, as measured by the F1 factor of the Anxiety Situations and Responses Inventory (Miguel-Tobal & Cano-Vindel, 2002). For this purpose, an experimental task based on the conception of explicit memory was carried out, specifically a free recall test, cuing the beginning of words, using words with evaluation anxiety content versus neutral words. The results and their clinical implications, as well as the limitations in the experimental study concerning the processing of threatening information, are discussed.

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Procesos cognitivos en la evaluación de la ansiedad: estudio experimental fundamentado en el sesgo de memoria

RESUMEN

En el presente artículo se presentan los datos de una investigación experimental cuyo objetivo fundamental fue explorar la presencia del sesgo de memoria en participantes con niveles elevados de ansiedad de evaluación en comparación con un grupo con baja ansiedad evaluativa medidos mediante el factor F1 del Inventario de Situaciones y Respuestas de Ansiedad (Miguel- Tobal y Cano-Vindel, 2002). Para ello se llevó a cabo una tarea experimental basada en la concepción de memoria explícita, en concreto una prueba de recuerdo libre con clave de inicio de palabras, mediante el uso de palabras con contenido de ansiedad de evaluación vs palabras neutras. Se discuten los resultados encontrados, sus implicaciones a nivel clínico y las limitaciones que se dan en el estudio experimental del procesamiento de la información amenazante.

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Determining the cognitive and metacognitive processes that operate in different psychopathological disorders is essential to understand and subsequently develop applied treatments in this field. From a cognitive perspective, some psychopathologies, such as depression or clinical anxiety, partially develop due to alterations in attentional and appraisal processes and in the individual's cognitive interpretation of a certain situation (Azais, 1995; Eysenck & Derakshan, 1997). Thus, anxious people are characterized by a biased filtering of stimulus information that is congruent with their emotional state (attentional bias) and by interpreting neutral information as threatening (interpretative bias), presenting more concrete and inflexible cognitive schemas than people who are not anxious. For some authors, negative interpretations or thoughts emerge from the activation of beliefs established in the long-term memory circuit, creating schemas in the cerebral memory structures that contain this type of information (Wells, 2000).

Throughout the past two decades, experimental evidence has very strongly supported the fact that people with anxiety disorders present attentional and interpretative biases towards threatening information. However, there is a third bias, called memory bias, which has emerged inconsistently in the different anxiety disorders and in the diverse conceptions and experimental paradigms (explicit vs. implicit recall tasks) that measure this bias (for a review, see Sanz-Blasco, Miguel-Tobal, & Casado-Morales, 2011).

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Explicit memory is considered as the tendency to recall previously presented material by means of conscious or deliberate recovery strategies. Focusing on the study topic of this article, there appears to be a memory bias in panic disorder (Boyer, Bisserbe, & Mialet, 1992; Lim & Kim, 2005) and, to a lesser extent, in posttraumatic stress disorder (Vrana, Roodman, & Beckham, 1995) and obsessive compulsive disorder (Coles & Heimberg, 2002).

The priming effect is understood as the influence of a certain stimulus (cue) on the subsequent performance of the processing system. Priming is used to assess implicit memory, which is both unconscious and unintentional, in tasks that measure the individual's mnestic performance. The results of diverse investigations are divergent, and memory bias appears in generalized anxiety disorder (Coles, Turk, & Heimberg, 2007).

In recent years and especially in the context of research on evaluation anxiety, without considering the explicit-implicit dichotomy of memory tasks, there have been positive results concerning the emergence of memory bias in the role of autobiographic memories in the course and maintenance of social phobia (Krans, de Bree, & Bryant, 2013; Morgan, 2010).

These results have been interpreted as a function of the levels of processing that are activated in each of the psychopathological entities. Whereas anxiety seems to be more closely related to automatic biases that affect early and pre-attentional levels of information processing, affective disorders such as depression are associated with elaborative and post-attentional biases, especially when the material processed is of an autobiographic nature with loss-related contents (Williams, Watts, MacLeod, & Mathews, 1997).

In the present experimental study, we shall study the presence of memory bias in individuals with high and low levels of self-reported evaluation anxiety. We shall attempt to explore the differences between the two groups in the rate of recall as a function of the type or content of the word used, specifically evaluation anxiety words versus neutral words.

As working hypotheses, we propose the following ones:

H1. People with high levels of evaluation anxiety, measured by means of the F1 factor of the Anxiety Situations and Responses Inventory-ISRA (Miguel-Tobal & Cano-Vindel, 2002), will have a tendency to recall more words with evaluation anxiety content versus neutral words in a recall task (explicit memory: free recall cued with the beginning of the word) in comparison with the group with low evaluation anxiety.

As women generally present higher levels of trait anxiety (Bowen, Offord, & Boyle, 1990; Costello, Egger, & Angold, 2005) as well as higher evaluation anxiety (greater fear of situations such as speaking with authority, in quality/performance, giving a speech in public, feeling observed while working, going into a room when everyone else is already seated, being the center of attention or speaking at a meeting) (Turk et al., 1998), our second hypothesis is:

H2. In comparison with men, women will show greater memory bias, in other words, higher recall of words of evaluative content versus neutral words.

Method

Participants

In the first stage, we assessed 175 university students from the Faculty of Psychology of the Complutense University of Madrid. According to the norms of the instrument for the F1 factor, participants scoring higher than percentile 75 made up the high evaluation anxiety group, whereas participants scoring lower than percentile 25 made up the low evaluation anxiety group. Therefore, the final sample was made up of 38 participants in the low evaluation anxiety group (M = 19.73, SD = 2.07) (low in F1), of whom 22 are women (M = 19.45, SD = 2.24) and 16 are men (M = 20.12, SD = 1.82),

and 46 participants in the high evaluation anxiety group (M = 18.82, SD = 1.33) (high in F1), of whom 31 are women (M = 18.83, SD = 1.36) and 15 are men (M = 18.80, SD = 1.32).

Design

The experiment used a mixed 2 x 2 x 2 factorial design. The between-subject factors were groups of evaluation anxiety with two levels (participants with high scores in evaluation anxiety vs. participants with low scores) and sex (men and women). The within-subject factor is the recall task with two levels (evaluation anxiety words and neutral words). The dependent variable is the recall rate (percentage) of words from each category (evaluation anxiety and neutral).

Materials

The stimuli were presented by means of the PowerPoint program of Microsoft 2007 on a compatible computer. The stimuli were presented in the center of the screen written in black on a white background, with a font size of 60 that could be selected in the program. The instructions of the test were presented in yellow on a black background (size 44).

The total of 24 adjectives, selected ad hoc for this investigation, were presented. The stimuli used in the memory tasks belonged to two differentiated categories: 8 words of evaluation anxiety (e.g., unsafe, silly) and 8 neutral words (e.g., honest, direct). The remaining 8 words, of mixed contents, were presented in groups of 4 words at the beginning and at the end of the stimulus contents in order to control for the primacy and recency effect present in any memory test.

All the participants had a workbook to record their recall on the memory test – a self-referential coding task in order to achieve the same coding level for each one of the words – which also contained the instructions to be followed, which were also presented on the computer screen along with the stimulus material.

Procedure

Participants with scores higher than or equal to percentile 75 or below percentile 25 in the Anxiety Situations and Responses Inventory- ISRA (Miguel-Tobal & Cano Vindel, 2002) were contacted by phone and requested to come to the laboratory of Human Psychology of the Faculty of Psychology of the Complutense University of Madrid. We used two Faraday cabins that were thermally, acoustically, and electromagnetically isolated.

The experimental protocol (see Annex I) was individually applied. Upon arrival, participants were instructed to sit in the Faraday cabin. After a brief adaptation period to the cabin conditions, they were requested to fill in an informed and voluntary consent form by which they agreed to the assessment of certain emotional parameters. We selected participants who did not present any recent psychopathology, were not receiving pharmacological and/or psychological treatment at that time, and did not present a relevant condition that could substantially interfere with the results of the test (substance consumption, lack of sleep, excess fatigue, pain, etc.) (for a detailed review of the experimental protocol, see Sanz-Blasco, Miguel-Tobal, & Casado-Morales, 2013).

Data Analysis

Data were analyzed with the statistical program SPSS, version 15.0 for Windows XP.

In order to ensure that the two groups were matched in the dependent variable (rate of recall), that is, that the possible group differences were due to the levels of anxiety and not to a differential