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Journal of Psychosomatic Research 70 (2011) 525–533

Journal of Psychosomatic Research

Differential effects of alexithymia subscales on autonomic reactivity and anxiety during social stress

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Received 22 February 2010; received in revised form 3 November 2010; accepted 9 December 2010

Abstract

Objectives: Alexithymia is characterized by a difficulty in identifying and describing one's emotions. Recent research has associated differential effects of the alexithymia facets to hypothalamic–pituitary–adrenal (HPA) axis markers during stress. This study aimed to analyze how the facets of alexithymia interact with autonomic reactivity as well as self- and observer-rated anxiety during a social stress task. **Methods:** With the use of a public-speaking paradigm, skin conductance levels (SCLs) and heart rate (HR) during the defined periods of baseline, preparation, stress, and recovery were assessed in 60 volunteers (42 females, mean age 22.8) categorized as having either high (HDA) or low (LDA) degrees of alexithymia. **Results:** We found smaller SCLs during preparation and speech in the HDA group. Regression analyses indicated that only the alexithymia facet "difficulty in describing feelings" (DDF) was associated with smaller electrodermal responses. In the HDA group, self- and observer-rated anxiety was higher in the HDA than in the LDA group, which was attributable to higher scores in the subscales "difficulty in identifying feelings" (DIF) and "externally oriented thinking" (EOT). **Conclusions:** Our data support and specify the decoupling hypothesis of alexithymia by showing that the facets of alexithymia are differentially related to autonomic reactivity as well as self- and observer-rated anxiety during social stress.
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Keywords: Alexithymia; Autonomic response; Social stress; Skin conductance; Anxiety; Social performance; Decoupling hypothesis

Introduction

Alexithymia is characterized by a marked difficulty in identifying, describing, and expressing one's emotions [1,2]. It was originally described by Sifneos [1] in patients with psychosomatic disorders and has been related to a broad range of physical and psychiatric disorders, e.g., alcoholism, drug addiction, and posttraumatic stress disorders [3]. At the present time, within both clinical and nonclinical populations, alexithymia is viewed as a continuous personality variable [4] which is usually assessed by the Toronto Alexithymia Scale [5]. This self-report questionnaire is the most widely used and well-validated assessment tool [5–7] assessing alexithymia with three main facets: namely, difficulties in identifying feelings (DIF), difficulties in describing feelings (DDF), and externally oriented thinking or a preoccupation with the details of external events (EOT). There is growing empirical evidence that these facets probably refer to different correlates [8–11] with high intercorrelations between the DIF and DDF subscales and lower intercorrelations to the EOT subscale [7,10,11].

Based on the observation that several stress-related diseases (see, e.g., Ref. [3]) are associated with high alexithymia, Martin and Pihl [12] suggested that alexithymia

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0022-3999/10/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.jpsychores.2010.12.003

may act as a vulnerability factor, possibly by enhancing stress responses [10,13,14], which is conceptualized in the "alexithymia–stress hypothesis." Empirical data are yet not consistent: both enhanced and reduced stress reactivity or no differences in relationship to alexithymia were found [13–15]. In this context, it is very interesting that a recent study by de Timary et al. [10] demonstrated that increased cortisol levels before social stress were associated with high scores in the DDF scale (difficulties in describing feelings) only. The authors suggested that their results shed new light on the "alexithymia–stress hypothesis," which may be of importance to better understand the relationship between alexithymia and diseases by highlighting the possibility that alexithymia modulates cortisol levels, possibly by affecting the anticipatory cognitive appraisal of situations [10]. Furthermore, de Timary et al. [10] emphasized the factorial structure of the construct alexithymia, which should be addressed in further studies and could be one reason for the inconsistent empirical results observed so far.

The question remains open as to whether the three facets of alexithymia differentially interact not only with the hypothalamus–pituitary–adrenal axis (HPA) as demonstrated by de Timary et al. [10] but also with the sympathetic–adrenal–medullary (SAM) system. Psychosocial stress is widely known to induce various adaptive responses of physiologic systems with particular increasing activities in the HPA as well as in the SAM system. Schommer et al. [16] emphasize that rapid habituation of HPA responses after repeated exposure to stressful stimulation is a frequently reported characteristic of the HPA axis, while contradicting and less consistent results were documented concerning sympathetic activity. The authors presented evidence suggesting that with repeated psychosocial stress, a dissociation of HPA and SAM response patterns can be observed. This dissociation is characterized by a different temporal profile of habituation of catecholamine responses of the SAM system as compared to the HPA axis [16].

Based on empirical data, it still remains unclear whether, and how, hypothesized differential effects of alexithymia subscales on autonomic reactivity interact with experienced feelings of anxiety or observer-rated behavior associated with social performance during social stress. Therefore, we conducted a study aiming to detect the differential effects of alexithymia subscales on autonomic reactivity, experienced feelings, and observer-rated measures of social performance, using a social stress paradigm. We hypothesized that differences in the DDF scale (difficulties in describing feelings) should be related to autonomic reactivity in a social stress task. As former results using autonomic measures are not consistent and as to our knowledge no former study exists directly targeting this question, we phrased our hypothesis in an exploratory way concerning the probable direction of such an interaction. Furthermore, we wanted to clarify how the alexithymia facets interact with experienced feelings and observer-rated measures of social performance during a social stress task.

Methods

Participants

Eighteen male and 42 female participants from the University of Munich (aged between 19 and 29 years; mean=22.82, S.D.=2.46) took part in this study. They were screened for alexithymia using the Toronto Alexithymia Scale (TAS-20 [5,17]). The TAS-20 is the most psychometrically valid and commonly used self-report measurement of alexithymia [5,18] consisting of 20 items rated on a five-point scale with total scores ranging from 20 to 100. Three subscales are formed: factor scale DIF (TAS 1) assesses difficulties in identifying feelings, factor scale DDF (TAS 2) concerns difficulty in describing feelings, and factor scale EOT (TAS 3) reflects concrete externally oriented thinking. We used the last quartile to categorize participants as having high (HDA; n=15) degrees of alexithymia and compared them to the other participants categorized as having low (LDA; n=45) degrees of alexithymia. In the HDA group, total TAS score was 52.3 (range 45–66) as compared to the LDA group, which had a total TAS score of 33.0 (range 25–43). Both groups significantly differed in total TAS score [T(df=58)=−11.58, P<.001] as well as in the three subscores [DDF: T(df=58)=−6.31, P<.001; DIF: T(df=58)=−8.75, P<.001; EOT: T(df=58)=−4.27, P<.001].

Furthermore, all participants were screened for health status using a detailed anamnestic questionnaire. Participants were only included if they did not have a history of any Axis I disorders, in particular anxiety disorders, according to the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (*DSM-IV*, American Psychiatric Association, 1994). None of the participants reported about drug intake (except of alcohol within a normal consumption range) or currently received any medication (except of contraceptives). The body mass index was assessed and participants were only included when lying within a range defined as normal by the WHO (18.5–25 kg/m^2 [19]). All subjects had normal or corrected visual acuity assessed by visual acuity boards. Experiments were conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained. All subjects gave their written informed consent.

Public-speaking anxiety paradigm

We used a modified public-speaking anxiety paradigm based on the Trier Social Stress Test (TSST [20]) with some changes referring to the original protocol (no attention tasks were used) to induce an emotional real-life situation. The testing procedure began with a 10-min rest period in which the baseline assessment took place. Thereafter, participants were directed to a second room where a "committee," consisting of three persons, was sitting at a table and a video camera was installed. The participants were asked to stand at a microphone in front of the committee. One of the committee members informed the participants that their

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