



The cognitive and affective alexithymia dimensions in the regulation of sympathetic responses

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ABSTRACT

Objective: The literature regarding research into alexithymia and sympathetic responses is far from consistent. An explanation might be on the way subjects are classified. Generally, subjects are diagnosed as either alexithymic or non-alexithymic on the basis of questionnaires focusing on the cognitive aspects of alexithymia. However, alexithymia, as originally defined, concerns both emotion-affective and emotion-cognitive deficits. The aim of the present paper is to study the importance of the affective and cognitive alexithymia components in the regulation of sympathetic responses.

Methods: Subjects, who scored extremely (either high or low) on both the cognitive and the affective components of alexithymia, were shown neutral and emotional pictures, while their GSR was measured.

Results: The affective alexithymia component, not the cognitive component, turned out to be an important factor in the regulation of GSR peak amplitude. The results further indicate a significant interaction of type of emotional deficit (cognitive by affective) on GSR latency times. Finally, suggestive evidence indicated that baseline values, defined by the levels during the second preceding the stimulus, are related to the cognitive component of alexithymia, in the sense that higher emotion-cognitive capacities result in higher baseline values.

Conclusions: We cautiously conclude that the classification of alexithymics on the basis of both the affective and cognitive components, rather than on the basis of the cognitive component only, might provide more consistent research results, and thus lead to a better understanding of emotional physiological responses in alexithymic subjects.

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1. Introduction

As early as the late forties of the last century, MacLean (1949) observed that, in a large proportion of patients with psychosomatic complaints, the emotions do not reach the level of full conscious symbolic and verbal elaboration, resulting in problems during psychoanalysis based psychotherapy (Ruesch, 1948; Groen et al., 1951; Sifneos 1975). Nemiah and Sifneos (1970) gave the following description of the psychological features of these patients: “These patients manifested either a total unawareness of feelings or an almost complete incapacity to put into words what they were experiencing. The associations of the majority of the patients were characterized by a) a near total absence of fantasy or other material related to their inner, private mental life of thoughts, attitudes and feelings, and b) a recounting, often in almost infinite detail, of circumstances and events in their environment, including their own actions. Their thoughts, that is, were stimulus-bound rather than

drive-directed.” Sifneos (1973) coined the term alexithymia (a = lack, lexis = word, thymos = mood or emotion (Sifneos et al., 1977)) for this complex of features. Thus, alexithymia has been defined by deficits in as well the cognitive as affective aspects of the mental emotional responses. Alexithymia measuring devices should therefore cover both types of deficits. This is all the more important, since it has been argued that the cognitive and affective aspects of emotions are regulated by different neural modules (Bermond et al., 2006; Bermond, 2008).

Although it has been demonstrated that stress induces or enhances alexithymia (Kristal and Krystal, 1988), recent results suggest strongly that alexithymia is a relatively stable personality trait (Picardi et al., 2005; Luminet et al., 2007).

It has been proposed that alexithymia enhances the probability of (psycho)-somatic complaints, and many publications support this notion (see Taylor et al., 1997 for review). Furthermore, it has been proposed that alexithymia results in increased emotional physiological responses, or increased autonomic baseline levels, which may explain the relationship between alexithymia and psychosomatic complaints (Gross, 2002; Thayer and Brosschot, 2005). However, the relevant literature presents conflicting results. Several studies indicated that alexithymia is related to higher baseline or relaxation-levels

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(Papciak et al., 1985; Henry et al., 1992; Wehmer et al. 1995; Infrasca, 1997; Fukunishi et al., 1999; Stone and Nielson, 2001; Gündel et al., 2004; Bagby et al., 2009). However other, though fewer, studies found lower values (Hyer et al., 1991) or failed to find effects (Newton and Contrada, 1994; Roedema and Simons, 1999; Neumann et al., 2004).

The literature regarding alexithymia and autonomic responses to stress or negative affect is also clearly equivocal. Some studies suggest that alexithymia is related to attenuated autonomic responses to stress (Newton and Contrada, 1994; Wehmer et al., 1995; Linden et al., 1996; Friedlander et al., 1997; Fukunishi et al., 1999; Roedema and Simons, 1999; Neumann et al., 2004), while others suggest the opposite (Papciak et al., 1985; Martin and Pihl, 1986; Infrasca, 1997; Waldstein et al., 2002; Gündel et al., 2004; Bagby et al., 2009) or found no effect (Rabavilas 1987; Franz et al., 1999; Stone and Nielson, 2001; Connelly and Denny, 2007). In the study conducted by Franz et al. (1999) it should be noted that although the results demonstrated no difference in mean GSR response, they also demonstrated that the fluctuations in GSR responses were significantly greater in low alexithymics compared to high alexithymic subjects. To make matters even more confusing, various studies used several measures of autonomic response, of which only one or a few were associated with the expected effect, or with just one of the alexithymia subscales (Nyklicek, 2004; Spitzer et al., 2005) for instance.

Three hypotheses have been proposed to explain the enhanced emotional physiological responses in alexithymics: the decoupling hypothesis (Papciak et al., 1985), the discharge theory (Cacioppo et al., 1992), and the stress hypothesis (Martin and Pihl, 1985). One theory has been proposed to explain lower autonomic responses in alexithymics. The hypo-arousal theory of alexithymia predicts that, under conditions of comparable emotional provocation, there is less physiological activation in individuals with alexithymic tendencies (Linden et al., 1996).

For the following reasons we believe that the hypo-arousal theory fits the classical alexithymic subject as described by Nemiah and Sifneos (1970). The severe reduction in affective feeling (see above) is an important element in their description of the alexithymic features. Damasio et al. have underlined the importance of the orbitofrontal cortex (O-FC) in the regulation of the emotional feeling and emotional decision-making (Damasio and Anderson, 1993; Damasio 1994, 1999; Bechara et al., 2000; Tranel et al., 2002; Bechara 2004), and specific O-PFC activations in reaction to emotion-inducing stimuli have been described (Taylor et al., 2002). The O-FC projects to the hypothalamus, where the orbitofrontal neurons connect with neurons projecting to the brainstem- and spinal-autonomic centers. It is by these connections that the O-FC has control over emotional autonomic responses (Simpson et al., 2001; Barbas et al., 2003). Finally, electrical stimulation of the O-FC produces many autonomic responses (Iversen et al., 2000).

Based on these neuropsychological data, it is feasible that subjects that show no or very low affective responses, also show low activation in their O-FC, and thus low activations in the brainstem- and spinal-autonomic centers, which would result in lower autonomic responses in the classical alexithymic subjects (Bermond et al. 2006; Bermond, 2008).

Most studies have used the Toronto alexithymia questionnaires, i.e., the TAS-26, TAS-R, or TAS-20 (Taylor et al., 1985; Taylor et al., 1992; Bagby et al., 1994). None of these scales, however, measures emotionalizing (reduced ability to experience emotional feelings). In addition, the TAS-R and TAS-20 do not measure fantasizing. Thus, although, the originators of the alexithymia concept included the affective components (reduced emotionalizing and fantasizing) of alexithymia explicitly (Nemiah and Sifneos, 1970; Nemiah, 1996; Sifneos, 1991, 2000) the TAS scales focus on the emotion-cognitive aspects of alexithymia.

For the reasons presented above, a failure to classify subjects with respect to affective alexithymia features may have introduced

uncontrolled variance into the data produced in the experiments reviewed above. In the present study, therefore, the distinction between the cognitive and the affective components is retained in the selection of subjects, i.e., we study the relationship between the affective and cognitive components of alexithymia, and emotion-induced sympathetic activation.

Our hypothesis is that adding the affective component, as a separate measure for alexithymia, will explain a significant part of the variance. In addition to measuring the amplitude of the physiological responses which allows for direct comparison with previous studies we also will explore baseline levels preceding the stimuli and latency times.

2. Methods

2.1. Alexithymia measurement

Alexithymia was measured by aid of the Bermond Vorst Alexithymia Questionnaire (BVAQ) (Vorst and Bermond, 2001). The BVAQ has five separate subscales, (8 items per subscale, four indicative and four contra-indicative) for all alexithymia features as discussed by others (Nemiah and Sifneos, 1970; Sifneos et al., 1977; Taylor et al., 1985; Nemiah, 1996; Sifneos, 1991, 2000; Hendryx et al., 1991); reduced capacities concerning: (1) 'emotionalizing' [When friends around me argue violently, I become emotional.], (2) 'fantasizing' [I have few daydreams and fantasies.], (3) 'identifying' emotions, [When I am upset, I know whether I am afraid or sad or angry.], (4) 'verbalizing' emotions [I like to tell others about how I feel.], and (5) 'analyzing' emotions, i.e., the opposite of Marty and M'Uzan's (1963) 'pensé opératoire' [I hardly ever consider my feelings.]. The original Dutch BVAQ and its translations all have acceptable to very-good psychometric properties, and its usefulness has been demonstrated in several different settings (Nähring and van der Staak, 1995; Houtveen et al., 1991; Zech et al., 1999; Berthoz et al., 2000; Van Dijk et al., 2002; Elzinga et al., 2002; Vorst and Bermond, 2001; Morera et al., 2005; Bermond et al., 2007; Debordea et al., 2008). For reasons of comparisons with the TAS-20, it should be noted that the BVAQ emotion-cognitive subscales (Identifying, Analyzing, and Verbalizing) cover the same domain as the TAS-20, because the sum-totals of these BVAQ subscales correlate highly ($r=0.80$) with the TAS-20 sum-totals (Vorst and Bermond, 2001).

In a previous research, exploratory and confirmative factor analyses of BVAQ subscale scores in various populations consistently produced two orthogonal factors (one factor comprises the subscales 'Emotionalizing' and 'Fantasizing', the other factor comprises 'Verbalizing-' and 'Identifying-emotions'). These factors reflect the emotion-affective¹ dimension and the emotion-cognitive dimension of alexithymia. Furthermore, this dichotomy has been theoretically underpinned by Bermond, 2008, and fits with neuropsychological data (Bermond et al., 2006). The subscale 'Analyzing-emotions' invariably loads on both dimensions, albeit with differing loadings in the various populations or languages (Vorst and Bermond, 2001; Bermond et al., 2007). Thus the BVAQ allows an analysis on the basis of the two alexithymia dimensions mentioned, henceforth called the cognitive alexithymia dimension (COG) and the affective alexithymia dimension (AFF). Since the subscale 'analyzing-emotions' loads, in the Dutch population, clearly on the cognitive dimension (0.77) and much less on the affective dimension (0.22) (Vorst and Bermond, 2001; Bermond et al., 2007), we included 'analyzing-emotions' in the cognitive dimension. In a study with 492 first-year psychology students the Cronbach's alphas for the AFF and COG dimensions turned out to be 0.768 and 0.874 respectively.

¹ 'Emotion affective' may seem redundant, however this label has been chosen to differentiate this dimension clearly from the 'emotion-cognitive dimension' ('identifying', 'verbalizing' and 'analyzing' emotions).

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