Sick and tired: psychological and physiological aspects of work-related stress

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10 Alexithymia, risk factor or consequence of work-related stress?*

Abstract

Background: Primary alexithymia has been proposed as a trait-like risk factor for various psychiatric disorders. Alternatively, secondary alexithymia has been conceptualised as an inadequate coping reaction to a stressful situation. This study investigated the level and the type of alexithymia associated with occupational stress. *Method*: On two occasions, 69 patients with work-related stress and 62 healthy participants completed self-report instruments to measure alexithymia (20-item Toronto Alexithymia Scale), burnout complaints (Maslach Burnout Inventory), and general distress complaints (Depression Anxiety Stress Scales, Checklist Individual Strength). Group-differences in alexithymia were analysed using ANOVA's. Type of alexithymia was investigated by a) determining absolute and relative stability, b) exploring state dependence by adjusting alexithymia for burnout and distress complaints, and c) associating recovery of complaints with change in alexithymia. *Results*: Alexithymia was significantly elevated in patients. In the patient group, absolute stability of two alexithymia dimensions (identifying feeling, describing feelings) and relative stability of one alexithymia-dimension (identifying feelings) was lower than in the healthy group. Cross-sectional group-differences became small and non-significant after adjustment for distress-complaints. In patients, change in alexithymia was moderately associated to symptom recovery. *Conclusion*: Elevated alexithymia among patients with occupational stress is highly state dependent, which indicates presence of secondary alexithymia.

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When work-related stress becomes severe and chronic and results in seriously impaired daily functioning (e.g., a person is not able to work), a formal diagnosis of adjustment disorder (American Psychiatric Association, 1994; World Health Organisation, 1992) or neurasthenia (World Health Organisation, 1992) may be assigned. Work-related neurasthenia can be considered the psychiatric equivalent of professional burnout (Maslach, Schaufeli & Leiter, 2001). Burnout is defined as a multidimensional concept consisting of emotional exhaustion, depersonalisation and diminished personal accomplishment (Maslach et al., 2001). Several factors involved in the development of work-related stress have been studied, including job characteristics, social support, and various personality characteristics (Maslach et al., 2001). Alexithymia refers to a cluster of cognitive-affective deficits in emotion-processing and is commonly viewed as a personality trait (Taylor, Bagby & Parker, 1997). Alexithymia is associated with a broad variety of psychopathologies, including depressive disorders (Saarijärvi, Salminen & Toikka, 2001; Sayar, Kirmayer & Taillefer, 2003), anxiety disorders (Fukunishi, Sasaki, Chishima, Anze & Saijo, 1996; Marchesi, Brusamonti & Maggini, 2000), somatoform disorder (Bankier, Aigner & Bach, 2001; Duddu, Isaac & Chaturvedi, 2003), and post traumatic stress disorder (Söndergaard & Theorell, 2004; Yehuda et al., 1997). An association between alexithymia and work-related stress disorders was therefore expected.

Clinical alexithymia is characterised by difficulties in experiencing and expressing emotions, a diminished inclination to think about emotions, and a reduction or incapacity to fantasise, in favour of a more externally oriented cognitive style (Sifneos, 1996; Taylor et al., 1997). Apart from alexithymia as a personality trait, also called primary alexithymia, a more state-like form of alexithymia is recognised, which is called secondary alexithymia. Secondary alexithymia is viewed as a defensive state reaction (Freyberger, 1977) or a state of failure of defences (Krystal, 1988) to a threatening, painful, or stressful situation, e.g. a traumatic event or a medical or psychiatric illness. An important distinction between primary and secondary alexithymia is stability; a personality trait is considered to be more stable than an alexithymic reaction to a particular event

Association between alexithymia and psychopathology may be explained in two ways. First, primary alexithymia is causally related to psychopathology because of impaired emotional processing (vulnerability hypothesis), or second, a common cause, e.g. a stressful situation, results in secondary alexithymia and psychopathology (reactivity hypothesis). It is important to note that the vulnerability and reactivity hypotheses do not exclude each other.

To the best of our knowledge, there are no studies that specifically address the relationship between alexithymia and work-related adjustment disorder, work-related neurasthenia, or professional burnout. Evidence from proximal conditions is inconclusive. Chronic fatigue syndrome, which shares its main characteristic exhaustion with burnout, was not associated with elevated levels of alexithymia in two empirical studies (de Gucht, Fischler & Heiser, 2003; Wood & Wessely, 1999). Depressive, anxiety and psychosomatic symptoms, commonly associated with work-related stress disorders, demonstrate strong associations with alexithymia (Lipsanen, Saarijärvi & Lauerma, 2004; Marchesi et al., 2000; Parker, Bagby & Taylor, 1991).

The major aim of this study was to examine the relationship between alexithymia and work-re-

lated stress disorders. First, it was hypothesised that alexithymia would be elevated among patients with work-related stress. An elevated level of alexithymia can reflect either primary or a combination of primary and secondary alexithymia. To determine the nature of alexithymia, we examined temporal stability and state (in)dependence of alexithymia. Following the guidelines formulated by Taylor and Bagby (2004), absolute change and relative stability, two common methods to establish stability of personality traits (Caspi & Roberts, 2001), were compared between patients with occupational stress and a healthy reference group. State dependence was examined by adjusting alexithymia for the degree of occupational stress and by associating symptom reduction with change in alexithymia. Differential outcome patterns were predicted for primary versus secondary alexithymia associated with work-related stress disorders. If alexithymia were exclusively primary in patients, high temporal stability, no or limited change and state-independence was expected.

Method

Participants

Hundred-and-thirty-one participants, i.e., 69 patients and 62 healthy individuals, took part in the study. All participants gave written informed consent. Group characteristics at baseline (T0) are presented in Table 1. Healthy participants were four years younger, $t(129) = 2.65$, $p = .009$, and had a higher level of education, $t(129) = -5.36$, $p < .001$, than patients. Gender distribution also differed between groups, $\chi 2(1) = 5.32$, $p = .021$.

Patients with work-related stress complaints were recruited through occupational physicians ($n = 56$) and general practitioners ($n = 4$) during regular visits, and by advertisements ($n = 9$). The intake procedure consisted of a screening interview by telephone during which presence of work-related stress complaints was assessed and a semi-structured diagnostic interview in a face-to-face setting. Both interviews were conducted by clinical psychologists. During the semi-structured interview, information was obtained about the complaints history, a short version of the Composite International Diagnostic Interview (CIDI; World health Organisation, 1997) was administered, and the Beck Depression Inventory (BDI; Beck & Steer, 1987) was completed by the patient. Patients were included in the study if a) they reported continuous fatigue and/or increased fatigability and at least two other stress complaints (e.g. increased irritability); b) the cause of the complaints was considered predominantly work-related, as judged by the psychologist, the referring clinician, and the patient; and c) work-related stress complaints had led to (partial) sickness leave for at least two weeks but less than six months. Patients with a primary diagnosis of depression, social phobia, panic disorder, somatoform disorder other than undifferentiated, post-traumatic stress disorder, obsessive-compulsive disorder, hypomania, and psychotic disorders, as assessed with the CIDI (World health Organisation, 1997), were excluded. Patients with severe depressive complaints were excluded using the BDI (Beck & Steer, 1987), applying a cut-off score of 25. This study was a part of a comprehensive project about treatment effectiveness of work-related stress. Therefore, patients were randomly assigned to either (a) individual, or (b) group stress-management training (SMT),

or (c) care as usual (CAU). SMT consisted of 12 sessions aimed at reducing work-related stress while promoting better coping. CAU was considerably less intensive than SMT and consisted of regular visits to the occupational physician or general practitioner (n = 15) or a maximum of five sessions by a psychologist or social worker (n = 9). For the present study, patients completed questionnaires about alexithymia, burnout and general distress complaints at T0 and T1. Total scores on the 20-item Toronto Alexithymia Scale (TAS-20) in patients ranged from 25 to 80 (M = 55.32, SD = 10.13) at T0 and from 31 to 73 at T1 (M = 48.60, SD = 9.39).

Healthy volunteers were recruited from the general working population by distributing calls for participation. Eligibility was based on self reported normal physical health and employment of at least 16 hours a week. Exclusion criteria were: psychiatric illness, experience of a traumatic event in the past six months, use of psychotropic medication, and currently taking sickness leave. Healthy individuals completed questionnaires about alexithymia and burnout complaints at T0 and T1, and about distress complaints at T0 only. Total TAS-20 scores in the healthy group ranged from 25 to 62 (M = 41.95, SD = 8.90) at T0 and from 30 to 67 (M = 43.54, SD = 9.95) at T1.

Materials and Methods

Alexithymia

Alexithymia was measured with the 20-item Toronto Alexithymia Scale (TAS-20; Trijsburg, Passchier, Duivenvoorden & Bagby, 1997), which consists of three factor scales: Identifying feelings (IDFE; 7 items, range: 7 – 35), Describing feelings (DESFE; 5 items, range: 5 – 25) and externally Oriented thinking (EOT; 8 items, range: 8 – 40). Items are scored on 5-point Likert scales (1 = strongly disagree, 5 = strongly agree). Higher scores indicate higher levels of alexithymia. Internal consistency in Dutch validation samples of students and psychiatric outpatients (Kooiman, Spinhoven & Trijsburg, 2002) was adequate to good for the factor scales IDFE and DESFE (range of Cronbach's alpha: .67 to .85) and moderate for EOT (range of Cronbach's alpha: .52 to .66). Test-retest reliability with a three months interval for the factor scales was adequate; correlations ranged from .66 to .71 (Kooiman et al., 2002). Internal consistency in the current samples was sufficient to good for IDFE and DESFE (Cronbach's alpha: .67 to .86) and not strong for EOT (healthy group: .59; patient group: .42). Haviland and Reise (1996) strongly recommend using factor scale scores only, since the alexithymia dimensions as measured with the TAS-20 show low to moderate associations.

Burnout complaints

Burnout complaints were assessed with the 15-item Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli & van Dierendonck, 2000). Three work-related dimensions are distinguished: Emotional exhaustion (i.e., feelings of intense fatigue; 5 items), Depersonalisation (i.e., an indifferent, distant and cynical attitude towards work; 4 items), and Professional competence (i.e., a feeling of professional accomplishment; 6 items). Items are scored on 7-point Likert scales (0 = never, 6 = always/daily). Mean subscale scores are calculated and higher scores reflect higher levels

of emotional exhaustion, depersonalisation, and professional competence. Internal consistency of the subscales is adequate to good (Cronbach's alpha: .70 to .90) and test-retest reliability over one to three months is moderate to good (correlation coefficients range from .60 to .82; Schaufeli & van Dierendonck, 2000).

General distress complaints

General distress complaints were measured with the subscale General fatigue of the Checklist Individual Strength (CIS; Beurskens et al., 2000) and with the Depression Anxiety and Stress Scales (DASS; de Beurs, van Dyck, Marquenie, Lange & Blonk, 2001). Items of the CIS are scored on 7-point Likert scales (1 = false, 7 = true). The General fatigue subscale consists of eight items and ranges from 8 to 56. Lower scores indicate less fatigue. The internal consistency of the fatigue subscale is very high (Cronbach's alpha: .95; van der Ploeg, Kleber & van der Velden, 2000). The DASS comprise three subscales of 14 items each, addressing anxiety, depression, and stress complaints. Presence and severity of complaints during the past week are rated on 4-point Likert scales (0 = not at all/never applicable, 3 = very much/most of the time applicable). Subscale scores range from 0 to 42; higher scores represent higher levels of complaints. Internal consistency of the subscales is very high (Cronbach's alpha's: .88 to .95) and test-retest reliability over a four-week period is adequate to good (correlations: .75 to .89; de Beurs et al., 2001; Nieuwenhuijsen, de Boer, Verbeek, Blonk & van Dijk, 2003).

Education

Education level was assessed as the highest completed education on a six-point scale ranging from 1 (Primary school), equal to seven years education, to 6 (University grade), which stands for at least 17 years of education. Percentage of sickness leave was calculated as the part of the hours employed that patients were called sick.

Statistical analyses

The patient and healthy group were compared on various background variables using Chi-square-tests for categorical variables and independent *t*-tests for continuous measures. Of the variables gender, age, and education, known for their association with alexithymia, gender and education appeared to be confounders in the association between group (patient or healthy) and alexithymia (i.e., > 10% change in bèta's of group). Results adjusted for confounding variables are presented. Group-differences in work-related stress at T0, symptom recovery among patients, and stability of health among healthy participants, were tested using independent and paired samples *t*-tests.

Group-differences in alexithymia were analysed using AN(C)OVA's for mean alexithymia scores and Chi-square tests for proportions of clinical alexithymia (i.e., TAS-20 total score ≥ 61; Taylor, Bagby & Parker, 1997). Relative stability of alexithymia between T0 and T1 was determined by correlation coefficients. Coefficients were compared between groups using Fisher's *z* transformations. Absolute stability (i.e., change) of alexithymia between T0 and T1 was examined using paired *t*-tests for mean scores and McNemar tests for proportions of clinical alexithymia. Change

was compared between groups by AN(C)OVA's on absolute change scores. State (of work-related stress) dependence of alexithymia was examined by adjusting the cross sectional ANCOVA's (on group-differences in alexithymia) for burnout and distress complaints. The outcomes of these adjusted analyses provided information about presence of group-differences in primary alexithymia. For a similar conceptual approach, see Lipsanen et al. (2004). In patients, associations between symptom recovery and change in alexithymia were examined by correlation coefficients. For symptom recovery, mean *z*-scores of symptom change between T0 and T1 were calculated for burnout complaints, distress complaints, and total complaints. Further, differences in change of alexithymia between high and low (or no) recovery groups (based on the median split of the mean recovery *z*-scores) were analysed with independent *t*-tests.

Of note, cross sectional analyses at T0 were based on all available data (i.e., 69 patients, 62 healthy participants). In addition, because data on distress symptoms were not collected for the healthy group at T1, distress scores at T0 were used instead when comparing complaints and analysing state dependence at T1. All analyses were performed using SPSS 12.0. Effect sizes (ES's; Cohen's d for differences of mean scores) and two-tailed outcomes were reported using a significance level of .05.

Results

Background variables and initial analyses

In Table 1, descriptive outcomes of the patient and healthy sample are presented. At follow-up (T1), 16 weeks after T0, 54 patients and 51 healthy individuals were re-assessed. At T0, dropouts were not

Table *1*: *Characteristics of patients and healthy participants.*

	Patient (*n* = 69) *M* (*SD*) / *n* (%)	Healthy (*n* = 62) *M* (*SD*) / *n* (%)
Gender (male / female)	45 / 24 (65 / 35)	28 / 34 (45 / 55)
Employment (blue / white collar)	8 / 61 (12 / 88)	2 / 60 (3 / 97)
Age (years)	41.10 (9.47)	36.77 (9.19)
Education (1-6) [1]	3.39 (1.39) [2]	4.63 (1.24) [3]
Hours employed	37.29 (5.66)	36.92 (6.72)
Sickness leave (%)[4]	82.93 (25.06)	0.00 (0.00)

[1] Mean education level on a six point scale, 1: Primary school, 6: University grade.
[2] Equals approximately 13 years of education.
[3] Equals approximately 15 years of education.
[4] Mean percentage of sickness leave calculated as: (hours called sick / total hours employed) * 100.

significantly different from non-dropouts on background variables, severity of alexithymia, or any of the complaints.

No significant differences in change of alexithymia between patients receiving either individual or group SMT and patients receiving CAU were observed (IDFE: ES's < 0.07, $F(2,50) = 1.31$, $p = .280$; DESFE: ES's < 0.16, $F(2,50) = 0.97$, $p = .386$; EOT: ES's < 0.34, $F(2,50) = 0.05$, $p = .952$). Hence, no evidence was found for a treatment effect on alexithymia.

Group-differences in alexithymia

Mean scores on alexithymia factor scales of patients and healthy participants are presented in Figure 1. At T0, patients had higher scores on the TAS-20 factor scales than healthy participants, IDFE: ES = 1.13, $F(1,127) = 37.51$, $p < .001$; DESFE: ES = 0.86, $F(1,127) = 21.26$, $p < .001$; EOT: ES = 0.10, $F(1,127) = 0.29$, $p = .589$. At T1, patients demonstrated higher a score on the factor scale IDFE (ES = 0.42, $F(1,101) = 4.15$, $p = .044$) and tended to score higher on the factor scale DESFE (ES = 0.35, $F(1,101) = 2.94$, $p = .089$) than healthy participants. On EOT, again, groups did not differ significantly, ES = -0.24, $F(1,101) = 1.40$, $p = .240$.

At T0, clinical alexithymia was more prevalent in patients ($n = 21$, 30%; $M = 66.34$, $SD = 5.68$) than in healthy participants ($n = 2$, 3%; $M = 61.63$, $SD = 0.88$), $\chi2(1) = 16.70$, $p < .001$. At T1, five patients (10%; $M = 66.35$, $SD = 5.12$) and two (other) healthy participants (4%; $M = 66.50$, $SD = 0.71$) scored in the clinical range. Prevalence at T1 did not differ significantly between groups, $\chi2(1) = 1.20$, $p = .273$.

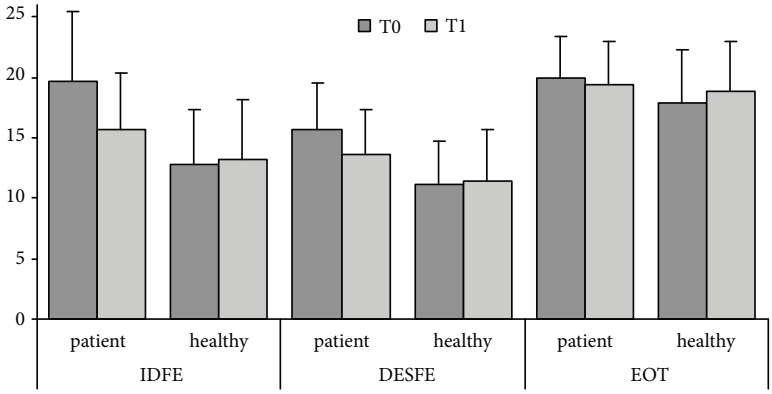

Figure 1: *Means and standard deviations on the TAS-20 factor scales at T0 and T1 of patients ($n = 54$) and healthy participants ($n = 51$).*

Note: IDFE: Identifying feelings; DESFE: Describing feelings; EOT: Externally oriented thinking; T0 = baseline measurement, T1 = follow-up measurement.

Group differences in work-related stress complaints

Mean scores on work-related stress complaints are presented in Table 2. At T0, patients had elevated scores on all complaints (ES's: 1.15 to 2.96) and reported reduced Professional competence (ES: -0.65), as compared to the healthy group (all *p*-values: < .001). Between T0 and T1, patients improved considerably on all complaints (ES's: -0.30 to -1.19, *p*-values: < .05), with the exception of reported Professional competence. In the healthy group burnout complaints did not differ between T0 and T1 (ES's: -0.01 to 0.11, *p*-values: > .51). At T1, all complaints of patients, as compared to healthy individuals, remained elevated (ES's: 0.40 to 1.36). Professional competence also remained reduced (ES: -0.82). All *p*-values were < .01.

Table 2: *Means (SDs) for burnout and distress complaints of patients and healthy participants at T0 and T1.*

	Patient (n = 54)		Healthy (n = 51)	
Burnout & distress complaints	T0	T1	T0	T1
Emotional exhaustion (0-6)	4.27 (1.18) [a]	3.02 (1.56) [b]	1.29 (0.78) [c]	1.29 (0.88) [d]
Depersonalisation (0-6)	2.95 (1.47) [a]	2.52 (1.36) [b]	1.41 (1.16) [c]	1.45 (1.15) [d]
Professional comp. (0-6)	3.88 (1.05) [a]	3.89 (0.94)	4.50 (0.85) [c]	4.59 (0.73) [d]
General fatigue (8-56)	42.63 (9.38) [a]	30.33 (12.61) [b]	20.96 (10.14) [e]	-
Depressive complaints (0-42)	12.94 (8.58) [a]	6.27 (7.01) [b]	2.61 (2.79) [e]	-
Anxiety complaints (0-42)	9.05 (7.24) [a]	4.14 (6.10) [b]	1.61 (1.51) [e]	-
Stress complaints (0-42)	19.65 (9.34) [a]	9.49 (7.57) [b]	5.31 (4.72) [e]	-

Note: Professional comp. = Professional competence; T0 = baseline measurement, T1 = follow-up measurement.
[a] Differences between patients and healthy individuals at T0 are significant, *p*-values < .001.
[b] Differences for patients between T0 and T1 are statistically significant, *p*-values < .05.
[c] Differences for healthy participants between T0 and T1 are not significant, *p*-values > .51.
[d] Differences between patients and healthy participants at T1 are significant, *p*-values < .001.
[e] Differences between patients at T1 and healthy participants at T0 are significant, *p*-values < .01.

Absolute and relative stability

Between T0 and T1, patients showed a substantial reduction on IDFE: ES = -0.70, $t(53) = -4.66$, $p < .001$, and a moderate reduction on DESFE: ES = -0.49, $t(53) = -3.28$, $p = .002$. No significant change was found on EOT: ES = -0.15, $t(53) = -1.20$, $p = .237$. Healthy participants did not change significantly on IDFE: ES = 0.09, $t(50) = 0.87$, $p = .389$, or DESFE: ES = 0.11, $t(50) = .93$, $p = .357$. A small increase was found for EOT: ES = 0.29, $t(50) = 2.56$, $p = .014$. Prevalence of clinical alexithymia re-

duced significantly between T0 and T1 in patients (McNemar, $p = .006$) and remained stable in the healthy group (McNemar, $p = 1.00$).

Patients demonstrated larger changes between T0 and T1 than healthy participants on the factor scales IDFE (ES = 0.80, $F(1,101) = 15.22$, $p < .001$) and DESFE (ES = 0.47, $F(1,101) = 5.26$, $p = .024$). For change on EOT, the increase in the healthy group tended to differ from the reduction of the patient group, ES = 0.36, $F(1,101) = 3.00$, $p = .086$.

Relative stability (i.e., Pearson correlation coefficients) of the alexithymia factor scales between T0 and T1 in the patient group was moderate: IDFE = .41, DESFE = .43, and EOT = .59. In the healthy group coefficients were .72, .63, and .68, respectively. The group-difference between the IDFE coefficients was statistically significant, $Z = -2.33$, $p = .020$. No statistically significant differences were observed between the DESFE ($Z = -1.42$, $p = .156$) and EOT ($Z = -0.82$, $p = .412$) coefficients.

State dependence

When adjusted for burnout complaints at T0, differences between the patient and the healthy group on IDFE (ES = 0.46, $F(1,124) = 4.52$, $p = .035$) and DESFE (ES = 0.50, $F(1,124) = 5.23$, $p = .024$) were moderate and significant. No difference on EOT was found (ES = -0.05, $F(1,124) = 0.05$, $p = .827$). After adjustment for symptoms of distress at T0, no significant differences were observed for any factor scale (IDFE: ES = 0.30, $F(1,123) = 2,04$, $p = 0.155$; DESFE: ES = 0.28, $F(1,123) = 1.67$, $p = .199$; EOT: ES = 0.09, $F(1,123) = 0.18$, $p = .672$). At T1, no significant differences were observed for any factor scale after adjustment for burnout complaints (IDFE: ES = 0.22, $F(1,98) = 1.01$, $p = .317$; DESFE: ES = -0.06, $F(1,98) = 0.03$, $p = .856$; EOT: ES = -0.31, $F(1,98) = 1.92$, $p = .169$) or symptoms of distress (IDFE: ES = 0.08, $F(1,96) = 0.16$, $p = 0.694$; DESFE: ES = 0.12, $F(1,96) = 0.33$, $p = .568$; EOT: ES = -0.30, $F(1,96) = 2.01$, $p = .159$).

Descriptive information about association between change in alexithymia and reduction of complaints among patients (i.e., Pearson's correlation coefficients and change scores for high and low recovery groups) is presented in Table 3. Correlation coefficients between relative symptom reduction and change in alexithymia were substantial for IDFE and DESFE on all complaints-domains. For EOT, coefficients were small to modest. Concerning group differences between high and low symptom-recovery groups in change on alexithymia, generally, the high recovery group demonstrated larger reductions on the factor scales than the low recovery group. No statistically significant differences between the high and low burnout-recovery groups were found for any of the TAS-20 factor scales (IDFE: ES = 0.14, $t(52) = -0.49$, $p = 626$; DESFE: ES = 0.29, $t(52) = -1.04$, $p = .304$; EOT: ES = 0.01, $t(52) = -0.05$, $p = .963$). The difference between the high and low distress-recovery groups was substantial and statistically significant for IDFE (ES = 0.62, $t(52) = -2.18$, $p = .034$). A trend was found for EOT (ES = 0.55, $t(52) = -1.99$, $p = .052$. No statistically significant difference was between the high and low distress-recovery groups on DESFE (ES = 0.44, $t(52) = -1.57$, $p = .122$). Differences between the high and low total complaints-recovery groups were statistically significant for IDFE (ES = 0.81, $t(39.9) = -2.81$, $p = .008$) and DESFE (ES = 0.58, $t(52) = -2.01$, $p = .049$). The difference for EOT was not significant, ES = 0.26, $t(52) = -0.95$, $p = .347$.

Table 3: *Correlations between relative symptom reduction and change in alexithymia, and mean change scores (T1 – T0) in alexithymia (SD) for high and low recovery patient groups.*

	IDFE	DESFE	EOT
burnout complaints	0.41**	0.44**	0.18
high recovery (*n* = 27)	-4.26 (7.04)	-2.43 (4.88)	-0.56 (3.19)
low recovery (*n* = 27)	-3.44 (5.01)	-1.26 (3.19)	-0.51 (3.50)
general distress complaints	0.47***	0.36**	0.34*
high recovery (*n* = 27)	-5.59 (7.11)*	-2.71 (4.70)	-1.41 (3.32)[a]
low recovery (*n* = 27)	-2.11 (4.26)	-0.97 (3.33)	0.33 (3.14)
total complaints	0.55***	0.49***	0.33*
high recovery (*n* = 27)	-6.03 (7.11)**	-2.94 (4.97)*	-0.97 (3.59)
low recovery (*n* = 27)	-1.67 (3.82)	-0.74 (2.75)	-0.11 (3.03)

Note: IDFE: identifying feelings; DESFE: describing feelings; EOT: externally oriented thinking; T0 = baseline measurement, T1 = follow-up measurement.
[a] $p < .10$, * $p < .05$, ** $p < .10$, *** $p < .001$.

Discussion

This study examined the level and nature of alexithymia in patients with work-related stress. As predicted, elevated alexithymia was found among patients. The level of alexithymia was in accordance with average levels in psychiatric outpatients (Kooiman et al., 2002; Marchesi et al., 2000; Saarijärvi et al., 2001; Sayar et al., 2003) and with prevalence of clinical alexithymia in psychiatric outpatients (Wise & Mann, 1994). Elevated levels were most strongly present on identifying and describing feelings.

To determine to what extent alexithymia was primary or secondary in nature, temporal stability and state dependence of alexithymia was assessed. Our findings consistently indicated that alexithymia in patients with work-related stress has limited stability and demonstrates state-dependence. First, stability coefficients of the alexithymia dimensions were of moderate magnitude, similar to those observed for state measures as depressive and anxiety symptoms in our patient sample (0.51, 0.48 respectively) and lower than generally reported for trait measures such as the Big Five personality traits (Roberts & DelVecchio, 2000; Small, Hertzog, Hultsch & Dizon, 2003). In addition, the coefficient of identifying feelings among patients was lower than among healthy participants. Second, absolute reductions in identifying and describing feelings between baseline and follow-up were substantial among patients. Likewise, the majority (73%) of patients identified as clinically alexithymic at baseline were no longer so at follow-up, reflecting considerable clini-

cally relevant change. Third, cross-sectional differences between patients and healthy participants in alexithymia reduced markedly after adjusting for work-related stress complaints. Particularly adjustment for distress complaints turned large and medium effect sizes into small or very small ones. Finally, relative symptom reduction among patients was substantially associated with change in alexithymia.

Partial state dependence of alexithymia has also been observed among patients with depression and anxiety disorders as indicated by a) a reduction of alexithymia in concert with reductions in depressive (Honkalampi, Hintikka, Saarinen, Lehtonen & Viinamäki, 2000; Luminet, Bagby & Taylor, 2001; Saarijärvi et al., 2001) or anxiety (Fukunishi et al., 1997; Marchesi, Fonto, Balista, Cimmino & Maggini, 2005) symptoms; b) strong reductions of prevalence of clinical alexithymia among remitted (Marchesi et al., 2005; Saarijärvi et al., 2001) or improved (Fukunishi et al., 1997) patients; and c) substantial associations between reductions in identifying and describing feelings and reductions in depression, distress (Saarijärvi et al., 2001) or anxiety (Fukunishi et al., 1997). Martínez-Sánchez et al. (2003), however, concluded that alexithymia among students measured before and after exams was stable. Relatively low levels of distress may explain this finding.

The state-dependent part of alexithymia found among patients is in line with the concept of secondary alexithymia. State-dependence of alexithymia was most notably evident in the identifying and describing feelings dimensions. Interestingly, the externally oriented thinking dimension, despite weaker psychometrical properties of the factor scale, displayed the strongest trait-like characteristics. An alternative explanation for substantial association and/or factorial overlap between the identifying and describing feelings dimensions and anxiety (Fukunishi et al., 1997; Marchesi et al., 2000; Marchesi et al., 2005) and depressive (Fukunishi et al., 1997; Honkalampi et al., 2001; Lipsanen et al., 2004; Saarijärvi et al., 2001) symptoms may be partial conceptual overlap.

The stable component of alexithymia supports conceptualisation as a personality trait (Luminet et al., 2001). Elevated levels of primary alexithymia in patients, supporting the vulnerability hypothesis, could not be entirely discarded, since moderate group-differences in alexithymia were still present when adjusting for burnout complaints. Alternatively however, these differences may be explained by imperfect adjustment for state variables (e.g. we did not adjust for all complaints together and not for psychosomatic complaints). In support of absence of state-independent differences is the 10% prevalence of clinical alexithymia in the patient group at follow-up, which is well within the range of prevalence estimations of 3.8% to 19% in the general population (Honkalampi et al., 2001; Luminet, Bagby, Wagner, Taylor & Parker, 1999; Marchesi et al., 2005).

Treatment implications for work-related stress disorders do not change as a result of the current outcomes, since elevated levels of alexithymia associated with these disorders can be conceptualised as mainly secondary. If future studies will demonstrate that elevated levels of secondary alexithymia hinder treatment effectiveness, SMT for work-related stress might be improved by treating secondary alexithymia. Teaching patients to identify and describe their own emotions may allow them to benefit more from SMT elements, e.g. cognitive techniques. Obviously, for the few patients with work-related stress with severe primary alexithymia, treatment implications need to be ad-

justed according to the available recommendations for primary alexithymia, i.e., a focus on behavioural and supporting techniques. However, first, diagnostic procedures need to be improved to identify these patients when they ask for treatment.

Our findings leave room for various conceptual interpretations of secondary alexithymia. These conceptual issues may be further addressed in future research. Important goals are: a) to separate the concept from affective symptoms or concepts as flattening of affect and emotional numbing, also stressed by Söndergaard and Theorell (2004); and b) to separate between a defensive reaction and a failure of defences. A better understanding of secondary alexithymia may be achieved by adding other measures in addition the TAS-20, as suggested by others (e.g. Söndergaard & Theorell, 2004).

Some limitations of this study deserve comments. First, alexithymia was measured when a work-related stress disorder had already developed. Investigating alexithymia prospectively in at risk individuals would clarify whether elevated primary alexithymia was present in individuals who later develop a work-related stress disorder. Second, although the TAS-20 is currently the most widely used instrument to measure alexithymia (Taylor, Bagby & Parker, 2003), it has some methodological imperfections. The factor structure demonstrates some instability across translations and the internal consistency of the EOT factor scale is not very strong (Haviland & Reise, 1996; Kooiman et al., 2002; Söndergaard & Theorell, 2004).

In sum, patients with work-related stress disorders demonstrate elevated levels of alexithymia, particularly on identifying and describing feelings. The present findings suggest that these elevations are consistent with an alexithymic reaction. Evidence for elevated primary alexithymia was minimal.

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