

# The Role of Early Emotional Neglect in Alexithymia

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Alexithymia is a personality trait associated with difficulties in identifying and communicating personal feelings. It is shown to be a risk factor for affective disorders. Previous studies have demonstrated the co-occurrence of alexithymia and early life stress in clinical samples; however, research in the absence of psychological and somatic disorders rarely exists. We therefore investigated alexithymia and early life stress in a high alexithymic but healthy community sample ( $n = 46$ ) in comparison with low alexithymic healthy subjects ( $n = 44$ ). Alexithymia was assessed by the Toronto Alexithymia Scale and Bermond-Vorst Alexithymia Questionnaire. Emotional functioning was also measured using the Emotional Experience Scales. Early life stress was assessed by the Childhood Trauma Questionnaire and Early Trauma Inventory. There was a significantly positive correlation between alexithymia and early emotional neglect (EN) in the total sample ( $r = .37; p < .001$ ), while physical or sexual traumata were not associated with high alexithymic features. EN also predicted the overall level of alexithymia. Within the high alexithymic group only, EN was related to significantly increased emotional dysfunction when controlling for alexithymia. The results show a first indication of differentiation between a “neglect” and a “nonneglect” subtype of alexithymia. We therefore conclude that EN should be taken into account in future studies on psychological functioning in alexithymia.

*Keywords:* alexithymia, early life stress, early emotional neglect, subtypes, etiology

Alexithymia is characterized by difficulties in identifying, decoding, and communicating one’s own emotional state and emotional aspects of social interaction processes. Alexithymic individuals tend to show a cognitive style primarily oriented toward external facts (Franz et al., 2008). In addition, alexithymia has been shown to be a risk factor for various psychological disorders (Taylor, Bagby, & Parker, 1997; Zackheim, 2007) and is related to increased individual and interpersonal distress (Humphreys, Wood, & Parker, 2009).

There is wide agreement on the conceptualization of alexithymia as a personality trait (Picardi, Toni, & Caroppo, 2005; Stingl et al., 2008; Salminen, Saarijärvi, Toikka, Kauhanen, & äärelä, 2006), showing a high degree of relative stability (Mikolajczak & Luminet, 2006). However, there is considerable debate about the etiology and risk factors for high levels of alexithymic features. Besides rather biological models, which associate alexithymia with

the dysfunction of specific brain structures (e.g., the anterior cingulate cortex: Lane, Ahern, Schwartz, & Kaszniak, 1994; for a critical review on interhemispheric transfer deficit theory see Tabibnia & Zaidel, 2005) or genetic factors (Jørgensen, Zachariae, Skytthe, & Kyvik, 2007), some authors suggest that alexithymia can develop as a reaction to an acute and severe traumatic event or in the presence of early life stress (Freyberger, 1977; Gündel, Ceballos-Baumann, & von Rad, 2002; Lumley, Neely, & Burger, 2007; de Vente, Kamphuis, & Emmelkamp, 2006). Extending these findings, recent studies have illustrated that alexithymia in adults itself is a predictor for the development of a posttraumatic stress disorder (PTSD) after exposure to a psychological or physical trauma (Frewen, Dozois, Neufeld, & Lanius, 2008; Frewen, Dozois, Neufeld, & Lanius, 2011; Zahradnik, Stewart, Marshall, Shell, & Jaycox, 2009). Moreover, early life stress has often been described as a risk factor for emotional dysregulation (Heim & Nemeroff, 2001; Kaplan, Pelcovitz, & Labruna, 1999; Pechtel & Pizzagalli, 2010). Accordingly, previous studies have demonstrated a co-occurrence of early life stress and alexithymia in patients with affective disorders (Honkalampi et al., 2004; Weber et al., 2008) or disorders with prominent affective symptoms such as PTSD (Zahradnik et al., 2009) and Borderline Personality Disorder (Zlotnik, Jill, & Zimmermann, 2001). The majority of studies has been conducted in clinical samples and reported significant correlations between physical or sexual traumatization and alexithymia (e.g., Kooiman et al., 2004; Moormann, Bermond, Albach, & van Dorp, 1997). However, it has never been investigated whether this association is also true for alexithymia as a phenomenon in the absence of psychological disorders and whether the experience of early life stress is related to specific emotional disturbances in alexithymia. To address these questions, the present study was conducted to determine the interdependen-

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cies of early childhood adversities and alexithymia in due consideration of subjectively perceived emotional functioning in psychologically and somatically healthy individuals.

## Method

### Participants

Ninety healthy and German native volunteers with an age range between 20 and 65 years were investigated regarding alexithymia, early life stress, and emotional functioning.

### Procedure

Note that this study on alexithymia and early childhood adversities is part of a large interdisciplinary research project on alexithymia in Germany (<http://www.languages-of-emotion.de/en/alexithymia.html>), and the elaborate recruitment procedures were necessary to create a sample that fulfills the requirements of different empirical investigations with different methodological approaches.

Participants were recruited between June and October 2008 by posting an advertisement in the Berlin subway trains announcing a “study on emotions.” Prior to participation, the volunteers signed an informed consent form, which had been approved by the university’s ethics committee. Our participants completed the 20-item Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994a) online as a web-based alexithymia screening instrument. A total of 2,500 volunteers completed the TAS-20 online, of which we assigned 100 volunteers to the high (h-ALEX, TAS-20 > 60) and 100 matched volunteers to the low alexithymic (l-ALEX, TAS-20 < 45) group. The TAS-20 cutoff points for high and low alexithymia were chosen according to the recommendations of Franz and colleagues (2008). Matching criteria were sex, age, education, and income. With regard to education, we built categories according to the German education system and made sure there were, in terms of percentage, as many l-ALEX volunteers in each category as there were h-ALEX volunteers. The same approach was applied to the variables “age” and “income”: We built categories of age and income ranges and paid attention to equal distributions between h-ALEX and l-ALEX participants. The 200 volunteers were then invited for a first face-to-face session to assess alexithymia and early life stress by questionnaire; a total of 182 participants ( $n = 97$  h-ALEX and  $n = 85$  l-ALEX) followed our invitation. Eight participants ( $n = 3$  h-ALEX and  $n = 5$  l-ALEX) had to be excluded due to scoring on the “minimization and denial” subscale of the Childhood Trauma Questionnaire (CTQ; see further explanation in the measures section). Also, in the first face-to-face session, every participant was interviewed by a trained clinical psychologist using the Mini International Neuropsychiatric Interview (Ackenheil, Stotz, Dietz-Bauer, & Vossen, 1999). Participants with any current or lifetime psychological disorder (affective disorders:  $n = 11$  h-ALEX,  $n = 9$  l-ALEX; anxiety disorders:  $n = 8$  h-ALEX,  $n = 1$  l-ALEX; personality disorders:  $n = 4$  h-ALEX,  $n = 1$  l-ALEX; substance abuse or dependence:  $n = 9$  h-ALEX,  $n = 3$  l-ALEX; not otherwise specified:  $n = 8$  h-ALEX,  $n = 14$  l-ALEX) or chronic or severe physical diseases or complaints ( $n = 7$  h-ALEX,  $n = 6$  l-ALEX) were excluded. In a second session of assessment, early life stress

interviews were conducted. Another three participants ( $n = 1$  h-ALEX and  $n = 2$  l-ALEX) gave inconsistent information on their experiences during childhood and were excluded from the study. In the end, the final sample consisted of 90 healthy volunteers divided into an h-ALEX ( $n = 46$ ) and a l-ALEX group ( $n = 44$ ). All participants were reimbursed for participation and received 50 Euros in total. The payment of expense allowances was not mentioned on the initial advertisement in the subway trains.

### Measures

**Assessment of alexithymia.** The degree of alexithymia was assessed using the two most frequently applied self-report questionnaires available in this field of research: the TAS-20 (Bagby et al., 1994a) was used as a screening instrument and the more detailed 40-item Bermond-Vorst Alexithymia Questionnaire (BVAQ; Vorst & Bermond, 2001) was applied for further assessment. Both scales have good psychometric qualities (TAS-20: Cronbach’s alpha > .80; Bagby, Taylor, & Parker, 1994b; BVAQ: Cronbach’s alpha > .85; Vorst & Bermond, 2001) and are widely used in the field of emotion research so that comparability with previous studies is assured. Psychometric properties of both scales have been investigated in healthy subjects in earlier studies (for TAS-20 properties see Franz et al., 2008; for BVAQ properties see Vorst & Bermond, 2001). The TAS-20 comprises three subscales: difficulty describing feelings (DDF; e.g., It is difficult for me to find the right words for my feelings), difficulty identifying feelings (DIF; e.g., I am often confused about what emotion I am feeling), and externally oriented thinking (EOT; e.g., Being in touch with emotion is essential; inverted item), whereas the BVAQ uses five subscales to assess the individual degree of alexithymia: verbalizing (e.g., I find it difficult to verbally express my feelings), identifying (e.g., When I am distressed, I know whether I am afraid or sad or angry; inverted item), and analyzing feelings (e.g., I hardly ever go into my emotions) as well as emotionalizing (e.g., When something totally unexpected happens, I remain calm and unmoved; i.e., emotional arousability) and fantasizing (e.g., Before I fall asleep, I make up all kinds of events, encounters and conversations; inverted item). On both assessment tools, high scores indicate high levels of alexithymia.

**Assessment of early life stress.** Adverse childhood experiences were assessed in retrospect using the CTQ (Bernstein & Fink, 1998). This self-report scale consists of 28 items that are assigned to the following five subscales: emotional neglect (EN; the experience of a caretaker’s failure to provide adequate affection and emotional support for the child; e.g., People in my family looked out for each other), emotional abuse (feeling verbally demeaned and emotionally hurt by one’s caretaker; e.g., People in my family said hurtful or insulting things to me), physical neglect (the experience of unmet physical needs; e.g., I had to wear dirty clothes), and physical abuse (the experience of physical assault during childhood; e.g., I was punished with a belt, a board, a cord, or some other hard object), as well as sexual abuse (the experience of coercive sexual contact with a caretaker; e.g., Someone tried to make me do sexual things or watch sexual things). Each subscale is composed of five items, each starting with “When I was growing up, . . .”. Subjects are asked to rate the degree to which they agree with each item on a 1 to 5 scale, from “never true” to “very often true.” Thus, scores range from 5 to 25 for each subscale with high

scores indicating a strong exposure to early life stressors. Three of the 28 items assess minimization and denial (e.g., I had the best family in the world), but are not part of the total score. We followed the authors' recommendation and excluded eight participants who answered at least one of these three items with "very often true." The questionnaire has good psychometric qualities in clinical and nonclinical samples (Cronbach's alpha > .83; Bernstein et al., 1998), is commonly used, and is a suitable instrument to detect early traumatic experiences beyond the scope of the trauma concept as referred to in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Diseases (ICD) classification systems (Maercker & Bromberger, 2005). In addition, the Early Trauma Inventory (Bremner, Vermetten, & Mazure, 2000) was administered in a second step of early life stress assessment. This semistructured interview is reported to have a good convergent validity based on high correlations with the CTQ ( $r = .72$ ; Wingenfeld et al., 2010) and was used in the present study to verify the individual data resulting from the questionnaire, namely the presence of an abuse or neglect history. The 45-min interview starts with an open conversation part in which subjects are given the opportunity to talk about basic data of their childhood first, before critical topics like EN or physical abuse are brought up. This procedure helps to create a climate of trust and may facilitate disclosure in the participants.

**Assessment of emotional functioning.** Subjectively perceived emotional functioning was assessed to capture the individual degree of emotional dysfunction and impairment in addition to alexithymia. Therefore, we used the 42-item Emotional Experience Scales (Skalen zum Erleben von Emotionen [SEE]; Behr & Becker, 2004) which have good psychometric qualities (Cronbach's alpha between .70 and .86; Behr & Becker, 2004) and include the following seven independent subscales: acceptance of one's own emotions (e.g., I've got some emotions that I would rather not have; inverted item), experience of emotion flooding (e.g., I wish I were not so affected by my emotions), experience of lack of emotions (e.g., I don't often feel my inner world), physical symbolization of emotions (e.g., Feelings like rapid heartbeat, stomachache, skin irritation can give me a good idea of what I want), imaginative symbolization of emotions (e.g., My daydreams give me clues as to my needs and my wishes), experience of emotion regulation (e.g., If I want to be in a better and livelier

mood, I can easily bring that about), and experience of self-control (e.g., I have ways of controlling my emotions). A total score does not exist, thus we used the subscales for analysis.

## Data Analysis

The data were analyzed with SPSS version 19.0 (SPSS Inc., Chicago, Illinois). A Bonferroni correction was applied to our alpha level of  $p < .05$  to adjust for multiple comparisons. Alexithymia (BVAQ), childhood maltreatment (CTQ), and emotional functioning (SEE) were treated as continuous variables: BVAQ total score, CTQ total score, and SEE subscales were normally distributed in the sample (Kolmogorov-Smirnov test, all tested variables  $p > .05$ ). Thus, analyses with the BVAQ, CTQ, and SEE scores were calculated using Pearson's correlation coefficient. Correlation analyses with the TAS-20 scores were calculated using Kendall's tau because the TAS-20 scores were not normally distributed in our sample (Kolmogorov-Smirnov test,  $p < .001$ ; bimodal distribution due to subject selection into two groups based on TAS-20 total scores). Linear regression analysis was used to detect the amount of variance in alexithymia explained by early life stress. Independent-sample  $t$  tests were performed to analyze group differences regarding alexithymia and early life stress. Bonferroni corrections were used to counteract the problem of multiple comparisons.

## Results

### Descriptive Statistics

The total sample included 90 healthy and German native volunteers with a mean age of 35.2 years ( $SD = 10.1$ ). Forty-six participants (23 males, 23 females) were considered high alexithymic (h-ALEX), while 44 participants (25 males, 19 females) scored low on alexithymia measures (l-ALEX). Eighty percent had the German general qualification for university entrance ("Abitur"). There were no differences between h-ALEX and l-ALEX participants with regard to age, h-ALEX:  $M = 36.5$ ,  $SD = 10.8$ ; l-ALEX:  $M = 33.8$ ,  $SD = 11.1$ ;  $t(88) = 1.71$ ,  $ns$ , education,  $\chi^2 = .92$ ,  $ns$ , and monthly income,  $\chi^2 = 1.79$ ,  $ns$ . As expected, alexithymia scores were significantly higher in the h-ALEX group than in the l-ALEX group (see Table 1). Within the h-ALEX group, T1

Table 1  
Test of Group Differences Regarding Alexithymia (N = 90)

Alexithymia Measures	h-ALEX ( $n = 46$ )		l-ALEX ( $n = 44$ )		$t$	$df$	$p$	$d$
	$M$	$SD$	$M$	$SD$				
TAS-20 total score	68.7	6.0	38.3	4.3	27.8	81	<.001	5.9
TAS-20 DIF	67.4	10.9	36.0	8.0	15.6	88	<.001	3.3
TAS-20 DDF	83.3	10.4	39.5	7.8	22.5	83	<.001	4.8
TAS-20 EOT	60.8	10.1	39.1	7.8	11.4	88	<.001	2.4
BVAQ total score	134.5	12.7	84.2	14.8	17.3	88	<.001	3.6
BVAQ verbalize	34.8	3.5	15.7	4.1	23.9	88	<.001	5.0
BVAQ identify	28.8	5.0	13.9	3.9	15.7	88	<.001	3.3
BVAQ fantasize	22.3	6.3	19.3	6.8	2.2	88	.030	0.5
BVAQ emotionalize	25.5	3.5	21.0	3.2	6.4	88	<.001	1.0
BVAQ analyze	23.3	5.5	14.3	4.5	8.3	88	<.001	1.8

Note. Bonferroni adjusted alpha levels of .005 per test (.05/10).

there were no gender differences regarding the TAS-20 and BVAQ total and subscale scores. Within the l-ALEX group, we found significant differences in alexithymia with slightly higher scores for males (TAS-20 DIF,  $p < .01$ ; BVAQ total score,  $p < .05$ ; and BVAQ emotionalize,  $p < .001$ ), as expected: This effect had already been described in a recent review on gender differences in alexithymia (Levant, Hall, Williams, & Hasan, 2009). The overall correlation between the two alexithymia measures (TAS-20 and BVAQ total scores) was  $r = .63$  (Kendall's tau;  $p < .001$ ).

### Relationship Between Alexithymia and Early Life Stress

Group differences regarding early life stress were examined using independent-sample  $t$  tests with Bonferroni corrected alpha levels. Early EN was the only CTQ subscale significantly higher in the h-ALEX group as compared with l-ALEX (see Table 2). There were no gender differences with regard to the CTQ total or subscale scores in either of the groups. Because there was a significant correlation between EN and age in the total sample ( $r = .29$ ,  $p < .01$ ), we conducted partial correlation analysis and controlled for age to explore the relationship between early life stress and alexithymia. There was a significant correlation between EN and alexithymia as measured by the TAS-20 and BVAQ total scores (see Table 3). Linear regression analysis revealed a 13% BVAQ variance explanation with EN as a predictor variable ( $\beta = .37$ ,  $p < .001$ ,  $R^2 = .127$ , corrected). Including age in the model did not considerably increase the amount of explained variance ( $R^2 = .130$ , corrected).

### Reported Emotional Functioning in Alexithymia as a Function of Early Emotional Neglect

Within the h-ALEX group only, early emotional neglect was still positively related to alexithymia as measured by the BVAQ ( $r = .32$ ,  $p < .05$ ; controlled for age) and the TAS-20 ( $r = .19$ ,  $p < .05$ ; controlled for age). There were no significant correlations between alexithymia and other CTQ subscales in this group as well. Regarding emotional functioning, we conducted partial correlation analysis to explore the relationship between EN and emotional dysfunction while controlling for alexithymia (because alexithymia would be a confounding factor in the assessment of emotional dysfunction). We applied Bonferroni adjusted alpha levels of .007 per test (.05/7). EN was significantly correlated with

Table 3

Relationship Between Alexithymia and Early Life Stress (N = 90; controlled for age)

Measures	BVAQ total score	TAS-20 total score
CTQ total score	.140	.170
CTQ – EN	.370***	.408***
CTQ – EA	.068	.092
CTQ – PN	-.111	-.079
CTQ – PA	-.075	-.090
CTQ – SA	-.133	-.131

Note. EA = emotional abuse; PN = physical neglect; PA = physical abuse; SA = sexual abuse; EN = emotional neglect; \*\*\*  $p < .001$ , Bonferroni adjusted alpha levels of .004 per test (.05/12).

a lower acceptance of one's own emotions ( $r = -.32$ ,  $p < .007$ ), with physical symbolization of emotions ( $r = .33$ ,  $p < .007$ ), and with subjectively perceived deficits in emotion regulation ( $r = .29$ ,  $p < .007$ ), suggesting a stronger impairment in high alexithymic subjects with a history of early emotional neglect as compared with high alexithymic subjects without such a history.

### Discussion

The study aimed to explore the relationship between a high degree of alexithymia and early life stress in a community sample of 90 psychologically and somatically healthy individuals. The main finding was a significant correlation between the degree of alexithymia and EN in early childhood with EN predicting approximately 13% of the variance. Other childhood trauma dimensions such as physical or sexual abuse were not significantly related to alexithymia in our sample. Within the h-ALEX group only, EN was related to lower acceptance rates of one's own emotions, a stronger physical symbolization of emotions, as well as subjectively perceived deficits in emotion regulation. In short, our study shows a significant relationship between the experience of early emotional neglect, adult alexithymia, and difficulties in experiencing emotions in healthy individuals. Although a cross-sectional investigation is generally not suitable for drawing etiological conclusions from the data themselves, some thoughts on a possible cause-effect correlation are presented in the following sections.

Previous investigations have shown that the development of emotional competences in childhood is mediated by close relation-

Table 2

Test of Group Differences Regarding Early Life Stress (N = 90)

Early Life Stress Measures	h-ALEX (n = 46)		l-ALEX (n = 44)		t	df	p	d
	M	SD	M	SD				
CTQ total score	39.2	9.4	35.2	11.5	1.8	88	.071	0.4
CTQ – EN	13.0	4.3	9.4	4.5	4.0	88	<.001	0.8
CTQ – EA	9.4	4.0	8.3	4.4	1.2	88	.271	0.3
CTQ – PN	5.9	2.3	6.1	1.6	-.48	88	.633	-0.1
CTQ – PA	5.7	1.2	6.0	2.1	-.96	69	.335	-0.2
CTQ – SA	5.2	1.0	5.4	1.8	-.48	88	.637	-0.1

Note. EA = emotional abuse; PN = physical neglect; PA = physical abuse; SA = sexual abuse; EN = emotional neglect. Bonferroni adjusted alpha levels of .008 per test (.05/6).

ships between the child and his or her primary caregiver (Thompson, 2008). From a theoretical perspective, the development of these relationships is best described in terms of Bowlby's construct of attachment (Bowlby, 1958). This influential theory proposes that emotional maltreatment by the caregiver can impede a secure attachment between caregiver and care recipient (Bekker, Bachrach, & Croon, 2007; Grusec, 2011) and might result in a child's mental health problems in adulthood of which one possible outcome is alexithymic tendencies (Frewen et al., 2008; Montebanarrocci, Codispoti, Baldaro, & Rossi, 2004). However, our data also show that high alexithymia may develop without any influence of EN. Forty-eight percent of the high alexithymic subjects in our sample had an EN score of 13 or below, and 26% reported minimal or even no emotional neglect at all (corresponding to a score of 10 or below, according to Baker & Maiorino, 2010). Thus, the developmental model of alexithymia only seems to be true for a certain percentage of high alexithymic individuals. What about the others? To answer this question one needs to consider the influence of genes and especially, with respect to EN, Gene  $\times$  Environment interactions (Aleman, Swart, & van Rijn, 2008) to better understand how alexithymia can develop in family environments with high and low degrees of emotional closeness and support.

Based on our results, we suggest that, with respect to etiology, there might be two subtypes of alexithymia: a "neglect type" and a "nonneglect type," differing in their respective degree of emotional competence. The idea of alexithymia subtypes is an important element of the ongoing debate about how to better conceptualize alexithymia. Because there are a variety of critical comments on the operationalization of alexithymia by the TAS-20 subscales only (e.g., Leising, Grande, & Faber, 2009; or Lumley et al., 2007), some authors have proposed the existence of two subtypes based on the cognitive and emotional subscales of the BVAQ. According to this model, alexithymia "Type I" is characterized by deficits in both emotional experiencing and emotional cognition, whereas alexithymia "Type II" is supposed to have unimpaired emotional experiencing but is lacking cognitive processing of emotion (Bailey & Henry, 2007; Larsen, Brand, Bermond, & Hijman, 2003). However, these two subtypes have failed to be supported empirically. In a large community sample of more than 1,500 subjects, Bagby and colleagues (2009) confirmed the 5-factor structure of the BVAQ, but were not able to reveal the proposed subtypes. We were also not able to find alexithymia "Type I" and "Type II" in our carefully recruited, psychologically, and physically healthy sample. However, taking longitudinal data into account, such as information on early emotional neglect, seems like a promising approach to explain the development of individual patterns of emotional competence. This might pave the way for new ideas of alexithymia subtype models to help explain variability among high alexithymic individuals, which has been suggested in several publications before (e.g., Lumley et al., 2007; Bagby et al., 2009).

The differentiation between a "neglect type" and a "nonneglect type" of alexithymia may also implicate new research strategies in future empirical investigations because it brings up a variable whose consideration might increase the amount of explained variance in future studies. There is considerable brain imaging research investigating the effects of early adverse experiences on neural correlates of affective functioning in clinical and community-dwelling populations (for a comprehensive review see

Pechtel & Pizzagalli, 2010; for a detailed description of structural and functional consequences of early life stress see Teicher et al., 2003; for a detailed review of psychoneuroendocrine research on early life stress see Heim, Newport, Mletzko, Miller, & Nemeroff, 2008). There also are a variety of results from emotion processing studies with high alexithymic individuals; however, none of these studies has ever considered either the influence of early emotional neglect on the "alexithymic brain" and its structural, functional, and neuroendocrine aspects or even the interaction of early emotional neglect and alexithymia with respect to neural correlates of affective functioning.

Our data show that early emotional neglect seems to play a role in the context of alexithymia. Other childhood trauma dimensions, such as physical or sexual abuse, were not significantly related to alexithymia in our sample. The experience of these qualitatively different trauma dimensions is probably more likely to be associated with other types of pathology (Modestin, Furrer, & Malti, 2005; Weber et al., 2008) that led to exclusion from our study. Previous research has shown that there are differential effects of childhood trauma dimensions on adult psychological functioning and the development of psychological disorders (Vogel et al., 2011). Although the effects of physical or sexual traumatization during childhood have been the predominant object of investigation in the field of trauma research in the past 20 years, there are already a few studies considering the impact of emotional traumata on the development of different pathologies (Grassi-Oliviera, Gomes, & Stein, 2011; Pederson & Wilson, 2009; Young, Lennie, & Minnis, 2011), and the present study underlines the need for further investigations as well.

### Limitations

In our study, alexithymia was assessed via self-report only. Of course this poses a problem, because alexithymia itself may limit an individual's capacity to answer items that require introspection, emotional awareness, and the ability to verbally express emotions (Stingl et al., 2008; Vanheule, 2008). These difficulties can be overcome by the use of structured interviews, but there was no validated German version of the Toronto Structured Interview for Alexithymia (Grabe et al., 2009) available at the time of data acquisition. However, we did not solely rely on the TAS-20 but added the BVAQ, a more detailed and widely used questionnaire in many studies on alexithymia. The fact that the BVAQ scores were normally distributed in a healthy sample set up by high and low TAS-20 total scores emphasizes the necessity of extending alexithymia assessment strategies to more detailed measures instead of using just one self-report measure with one specific focus.

Our alexithymic subjects' reduced awareness for emotional processes might have led to an inaccurate interpretation of their childhood environment as negligent and unsupportive. However, there are several arguments refuting this criticism. First of all, the items of the CTQ emotional neglect subscale are carefully worded and based on external behavior (e.g., "People in my family looked out for each other"). Second, to overcome possible difficulties of the CTQ and questionnaire assessment in general, as well as misunderstandings or misconstructions due to alexithymia, our subjects ran through a face-to-face early life stress interview to validate the individual emotional neglect scores of the questionnaire. In this interview, subjects were explicitly asked for various

examples of observable behavior to explain their experience of a negligent environment. In case of lacking consistency or missing examples, subjects were excluded from participation. Third, if high emotional neglect scores were exclusively due to alexithymia, there should not have been a “nonneglect” subtype of alexithymia in our sample of physically and psychologically healthy individuals. Participants’ possible motivation to minimize difficulties within families, which could be held responsible for the identification of a “nonneglect” subtype in our sample, was controlled by using the “minimization and denial” subscale of the CTQ to identify participants with such tendencies (as described in the measures section).

However, the criticism of using two measures of early life stress that are subject to the nature of reconstructive memory remains. This limitation could have been reduced by including medical records in the process of data collection or by interviewing family members. Because early emotional neglect is a form of childhood adversity mostly lacking visible bodily injury, it would have been difficult to consult our participants’ medical records from childhood. From the personal interviews, we know that many participants were not in regular contact with their parents and siblings. As a consequence, a family member interview would have been difficult to arrange and probably emotionally draining for our participants. Nevertheless, this limitation should be kept in mind when interpreting and thinking about the data we presented here.

Finally, our results might not be easily transferable to the German general population because the overall level of education and income was relatively high in our sample as compared with the German average. As a recent study showed, variables such as socioeconomic status may have a considerable influence on an individual’s development after the experience of early childhood adversities (Mock & Arai, 2010). Our participants might still be living in a preferential environment due to good education and the absence of financial distress that has been protecting them from psychological and physical illness. Due to our volunteers’ high socioeconomic status, one can at least preclude that the reimbursement for participation would have had any influence on our volunteers’ decision to take part in the study.

### Conclusion

In our study of 90 physically and psychologically healthy individuals, we found a significant association between alexithymia and the experience of early emotional neglect as measured by self-report. We also found evidence suggesting two subtypes of alexithymia: a “neglect” and a “nonneglect” type. High alexithymic individuals with a history of early emotional neglect seem to experience specific difficulties in emotional functioning that cannot be traced back to their individual degree of alexithymia, such as a lower acceptance of one’s own emotions, a stronger physical symbolization of emotions, as well as problems regulating emotional states. However, instead of only focusing on difficulties and emotional dysfunction, our data also show that early life stress and emotional neglect in particular does not necessarily lead to psychological disorders. Our h-ALEX volunteers had a relatively high socioeconomic status and were psychologically and physically healthy despite their history of early emotional neglect.

In future studies on alexithymia, the assessment of early life stress should be taken into account with regard to revealing new

facets of emotional competence and other clinically significant variables potentially underlying this developmental pathway. Due to the considerable impact of early life stress on brain development, this is especially true for studies investigating neural correlates of affective functioning in alexithymia.

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