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Meta-analysis of Alexithymia in Posttraumatic Stress Disorder

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Abstract

The present meta-analytic review investigated the prevalence of alexithymia in individuals with posttraumatic stress disorder (PTSD). A large effect size was found associating PTSD with alexithymia. Effect sizes were higher in studies of male combat PTSD samples in comparison with studies of other PTSD samples. Clinical and research directions are discussed.

Key words: Alexithymia, Emotional Awareness, Posttraumatic Stress Disorder, Meta-Analysis.

Meta-analysis of Alexithymia in Posttraumatic Stress Disorder

Disturbances in emotional experience and expression are often present in individuals with posttraumatic stress disorder (PTSD), and several theories have been put forward to account for these disturbances (reviews by Brewin & Holmes, 2003; Dalgleish, 2004). One form of emotional-experiential and -expressive disturbance is alexithymia, a psychological construct defined by difficulties in identifying and labeling emotional feelings and a tendency toward externally-oriented thinking (Sifneos, 1973; Taylor, Bagby, & Parker, 1997).

Since the seminal clinical observations of Krystal (1968, Krystal & Krystal, 1988), empirical studies have confirmed an increased prevalence of alexithymia in PTSD samples. The present article meta-analyzes these studies to evaluate the size of these effects, as well as to test whether they vary by trauma type and gender.

Method

Literature Review

The *PsychINFO* and *PubMed* databases were searched using the keywords *'alexithymia'*, *'posttraumatic stress disorder/PTSD'* and *'trauma'*. Articles referenced by studies identified by these searches were also reviewed. To the authors' knowledge, the present review encompasses all English-written published studies that have reported *alexithymia scores* in a PTSD sample up to July 2007 other than that of Cloitre et al. (1997), which could not be included due to their use of non-parametric statistics. Study authors were contacted to provide information that was unavailable in the published manuscripts. Studies of PTSD symptoms in non-diagnosed samples (e.g., McCaslin et al., 2006) were not included to insure a minimum level of PTSD severity. *'Alexithymia scores'* in this context refer to scores on psychometric scales of alexithymia that are widely recognized within the literature as such, most notably, versions of the *Toronto Alexithymia Scale* (see Taylor et al., 1997 for review). This measure has

demonstrated strong psychometric properties, particularly the 20-item version (Bagby, Parker, Taylor, 1994; Parker, Taylor, & Bagby, 2003).

Meta-analytic calculations

Weighted-mean effect sizes (*d*) were calculated following Hedges and Olkin (1985) with diagnosed PTSD samples compared with study sample control groups (referred to hereafter as d_{SAMP}) as well as population norms for the respective psychometric alexithymia scale used (referred to hereafter as d_{POP}). The population norms used for the d_{POP} calculations were the following: *TAS-20* (from: Parker, Taylor, & Bagby, 2003, Table 3): $\mu_{M(N=868)} = 47.30$, $\sigma = 11.32$, $\mu_{F(N=1065)} = 44.15$, $\sigma = 11.19$, $\mu_{M\&F(N=1933)} = 45.57$, $\sigma = 11.35$; *TAS-23* (from: Taylor, Bagby, Parker, 1992, Table 2): $\mu_{M(N=55)} = 59.76$, $\sigma = 11.00$, $\mu_{F(N=84)} = 59.11$, $\sigma = 10.44$, $\mu_{M\&F(N=139)} = 59.40$, $\sigma = 10.70$; *TAS-26* (from: Taylor, Ryan, & Bagby, 1985, Table 3): $\mu_{M(N=126)} = 63.32$, $\sigma = 10.90$, $\mu_{F(N=370)} = 61.11$, $\sigma = 11.33$, $\mu_{M\&F(N=542)} = 61.80$, $\sigma = 11.27$.

d values were classified following Cohen (1988) as follows: small (≥ .20), medium (≥ .50), and large (≥ .80). Significant heterogeneity evident in the combined effect-sizes was parsed a priori by examining trauma-type and gender as moderators. For d_{SAMP}, Rosenthal's (1979) corresponding 'Fail Safe N' (FSN) was calculated, which is interpreted as the number of studies with null effects ($d = 0$) required to render d_{SAMP} zero.

Results

Study Descriptive Information

Twelve studies were located in the literature searches that met study inclusion criteria totaling a PTSD sample of 1095. Study sample control groups in these studies varied as follows: Hyer et al. (1990) compared PTSD veterans to general psychiatric outpatient veterans; Phan et al. (2006) compared veterans with versus without PTSD; Zeitlin et al. (1989) compared combat veterans with PTSD to healthy non-combat controls; Sőngergaard & Theorell compared refugees with versus without PTSD; Yehuda et al. (1997) compared holocaust survivors with versus without PTSD; Zeitlin et al. (1993) compared rape victims

with versus without PTSD; and Zlotnick et al. (2001) compared individuals with PTSD to other general psychiatric outpatient samples.

Effect Sizes

Table 1 reports descriptive information and effect sizes for the 12 studies. The mean effect size when PTSD samples were compared with study samples was d_{SAMP} = 0.80 (*SE* = 0.10, 95% C.I. = .60 ≤ d_{SAMP} ≤ 1.00), a large effect. The number of studies with null effects that would be required to render this effect size to zero (FSN) = 370. The mean effect size when PTSD samples were compared with normative values for non-psychiatric populations was d_{POP} = 1.20 (*SE* = 0.04 95% C.I. = 1.10 ≤ d_{POP} ≤ 1.30), also a large effect.

Moderators

When calculated relative to non-psychiatric population norms, combat veteran PTSD samples displayed a larger mean effect size than non-combat veteran PTSD samples: d_{POP} = 1.71 (*SD* = 0.55) vs. d_{POP} = 1.02 (*SD* = 0.41), respectively, $t(9) = 2.37$, $p = .04$ (2-tailed). Similarly, the ratio of males to females within each study PTSD sample significantly correlated with the d_{POP} value, $r(9) = .70$, $p = .03$ (2-tailed).

Discussion

This meta-analysis supports the hypothesis that individuals with PTSD experience symptoms of alexithymia. Alexithymic symptomatology was particularly characteristic of males with combat-related PTSD although individuals with non-combat related PTSD also displayed clinically-elevated alexithymia. Future research will need to take gender differences in alexithymia within the normal population into account in tests of the effects of alexithymia in PTSD in relation to gender and trauma-type, as in the present review these factors were confounded (combat samples were 100% male, non-combat samples were 20% male).

These findings may have significant clinical implications. For example, it has been proposed that certain individuals with PTSD may require modularized interventions not only for reprocessing traumatic memories but also for ameliorating more general deficits in emotional awareness and regulation such as

alexithymia symptoms (e.g., Cloitre, Cohen, & Koenen, 2006). However, it remains to be shown whether individual differences in alexithymia represent negative prognostic indicators in PTSD.

Future studies should assess the impact alexithymia may have on emotional experience and expression in response to emotion-activating stimuli in PTSD (Litz, Orsillo, & Kaloupek, 2000; Miller & Litz, 2004; Orsillo, Batten, Plumb, Luterek, & Roessner, 2004; Wagner, Roemer, Orsillo, & Litz, 2003). It may be helpful for future studies of this type to employ self-referential paradigms, detailed assessments of participants' emotional experience, and non-self-report measurements of emotional response (e.g., psychophysiology, neuroimaging).

The present review has limitations. For example, the population norms used for calculation of the d_{POP} effect sizes may have been biased by demographic and/or other non-specific differences between the PTSD sample and normative group that were not consistently reported by study authors. The d_{SAMP} and d_{POP} values found for certain studies also varied suggesting that the magnitude of the effects may depend on the control group studied, particularly if the control group is another psychiatric group rather than a healthy sample (although Hyer et al., 1990 and Zlotnick et al., 2001 showed PTSD samples scored higher than other psychiatric outpatients). The fact that participants in the studies comprising this meta-analysis were not randomly sampled from the PTSD population also means that the results may not generalize beyond the specific samples studied. Additionally, studies rarely uniquely compared the distinctive sub-dimensions of alexithymia, making it unclear whether individuals with PTSD are more likely to display all characteristics of alexithymia or only specific sub-dimensions [2]. Finally, the degree of trauma exposure has typically not been evaluated as a moderating variable, and in turn the timing of trauma exposure within emotional and cognitive development [3]. However, it is conceivable that symptoms of alexithymia relate to developmental trauma exposure independent of PTSD symptoms. For example, developmental models such as that of Lane and Schwartz (1987; Lane et al., 1997) posit that cognitive abilities with respect to emotional awareness and expression undergo developmental progression within the context of attachment

relationships, and traumatic experiences and neglect occurring during childhood may disturb this natural development, culminating in severe cases in alexithymia in adulthood. Consistent with this proposal Frewen et al. (2007) and Zlotnick et al. (2001) found that alexithymia symptoms correlated with retrospectively-reported experiences of childhood emotional neglect.

In conclusion, the present meta-analytic results provide support for an association between PTSD and alexithymia. It is nevertheless important not to misconstrue the present results as suggesting that *all* PTSD subjects are alexithymic. Instead, it is hoped that this review will spark continuing clinical and research interest into the complex disturbances in emotional experience and expression, such as of alexithymia, that may be present in certain individuals with PTSD and complex trauma histories.

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Footnotes

[1] The corresponding value for d_{POP} is not presented due to it being artificially elevated due to the large control group *n*-size.

[2] Sondergaard & Theorell found refugees with versus without PTSD to differ only on the *Difficulty Identifying Feelings* factor of the TAS-20, whereas Monson et al. (2004) found that *Externally-Oriented Thinking* scores were the only significant individual predictor of CAPS total scores when each of the three TAS-20 subscale scores were entered individually in a multiple regression analysis.

[3] Zietlin et al. (1993) found that, whereas rape victims with versus without PTSD did not differ in alexithymia, rape victims were more alexithymic than were individuals who had not experienced rape. Moreover, rape victims who had experienced more than one assault were more alexithymic than were victims of only a single assault. In contrast, neither Yeduda et al. (1997) nor Badura (2003) found that trauma exposure correlated with degree of alexithymia.

Table 1 Note

Note: M = Male, F = Female, SE = Standard Error of the Effect Size, TAS = *Toronto Alexithymia Scale*, MMPI = *Minnesota Multiphasic Personality Inventory*, [1] see Kleiger & Kinsman (1980), low scores reflect greater alexithymia therefore sign of *d*-values was reversed; n-av = data not available due to lack of a control group.

Table 1

Study descriptive statistics and effect sizes for self-report studies of alexithymia

#	Reference	Trauma Type	Control Group	Scale	n_{PTSD} (M:F)	M_{PTSD} (SD)	n_{CONT} (M:F)	M_{CONT} (SD)	d_{SAMP} (SE)	d_{POP} (SE)
1	Badura (2003)	Combat	None	TAS-23	274 (274:0)	75.14 (11.67)	n-av	n-av	n-av	1.40 (0.2)
2	Monson et al. (2004)	Combat	None	TAS-20	85 (85:0)	74.35 (9.55)	n-av	n-av	n-av	2.40 (0.1)
3	Ramirez et al. (2001)	Combat	None	TAS-20	353 (353:0)	72.12 (12.04)	n-av	n-av	n-av	2.20 (0.1)
4	Zeitlin et al. (1989)	Combat	Non-psychiatric	TAS-26	25 (25:0)	78.20 (16.60)	10 (10:0)	54.60 (6.60)	3.27 (0.9)	1.37 (0.2)
5	Phan et al. (2006)	Combat	Non-psychiatric	TAS-20	16 (16:0)	61.30 (19.90)	15 (15:0)	52.50 (7.90)	1.59 (0.5)	1.20 (0.1)
6	Hyer et al. (1990)	Combat	Psychiatric	MMPI Alexithymia [1]	76 (76:0)	8.90 (2.50)	75 (75:0)	10.40 (3.20)	0.47 (0.2)	n-av

7	Cloitre et al. (2002)	Childhood Abuse	None	TAS-20	58 (0:58)	55.43 (11.77)	n-av	n-av	n-av	1.00 (0.1)
8	Söndergaard & Theorell (2004)	Refugees	Non-psychiatric	TAS-20	32 (23:9)	61.41 (12.57)	54 (31:23)	55.44 (12.17)	0.48 (0.2)	1.40 (0.1)
9	Yehuda et al. (1997)	Holocaust	Non-psychiatric	TAS-20	30 (9:21)	56.93 (14.37)	26 (13:13)	47.15 (12.69)	0.93 (0.3)	1.00 (0.1)
10	Zeitlin et al. (1993)	Rape	Non-psychiatric	TAS-26	12 (1:11)	64.67 (11.62)	12 (0:12)	65.50 (14.66)	-0.09 (.4)	0.25 (0.3)
11	Frewen et al. (2007)	Mixed	Non-psychiatric	TAS-20	105 (12:93)	59.38 (13.67)	45 (16:29)	35.39 (8.86)	2.71 (0.3)	1.20 (0.1)
12	Zlotnick et al. (2001)	Mixed	Psychiatric	TAS-26	29 (n-av)	76.69 (14.43)	223 (n-av)	70.20 (12.45)	0.52 (0.2)	1.32 (0.2)