The Preliminary Development of a Scale to Measure Trauma Disclosure: The Mississippi Trauma Disclosure Scale

Rodney A. Bragdon

Department of Psychology, Shenandoah University, 1460 University Drive, Winchester, VA 22601 U.S.A.

Abstract

Trauma disclosure (TD) is a core component of most PTSD treatments. Trauma cue avoidance is a hallmark of PTSD, and TD may index emotional processing of trauma which may moderate the development of PTSD. Despite a need for valid TD measures, existing measures (a) focus on narrow populations, (b) ask participants to forecast disclosure, and/or (c) lack psychometric support data. This project evaluated the psychometrics for the Mississippi Trauma Disclosure Scale (MTDS), designed to quantify disclosure of both objective trauma experience and emotional responses, two components theorized as necessary for successful PTSD treatment. Two studies with different populations (college undergraduates and substance abuse inpatients) supported the MTDS's initial factor structure, internal and test-retest reliability, and construct validity. Both researchers and clinicians may find the MTDS a useful tool.

Keywords: *trauma disclosure, PTSD, assessment, reliability, validity*

I. INTRODUCTION

Prevalence of traumatic events in the general population is substantial. Years of epidemiology studies have demonstrated that approximately 80% of individuals living in the United States have experienced at least one traumatic experience; yet, the vast majority of these trauma-exposed individuals (i.e., < 10%) do not develop posttraumatic stress disorder (PTSD) [1]. Despite these consistent findings and the surge in PTSD research over the past several decades, little is known about how trauma-exposed individuals sustain or resume normal functioning without treatment.

Chronic avoidance of anxiety-provoking stimuli is thought to cause or maintain many forms of psychopathology, including PTSD, and self-exposure may be preventative [2]. A core PTSD symptom is persistent avoidance of trauma-related stimuli, including "distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s)" [3]. The systematic disclosure of the traumatic experience and associated thoughts and emotions comprises prolonged exposure, one of the primary treatments for PTSD. Prolonged exposure is one of only four treatments for PTSD classified as "strongly recommended" by the American Psychological Association [4]. Prolonged exposure also earned a "strong" recommendation (the highest level of recommendation) from the PTSD treatment guidelines created by the International Society for Traumatic Stress Studies (ISTSS) [5].

Processing of trauma experience is a key component of theorized PTSD therapeutic mechanisms, and disclosure to oneself or others (i.e., trauma disclosure; TD) may be used to index previous emotional processing of the trauma [6] or may be seen as a necessary component of processing [7] – [11].

The development of measures to assess TD to others lags far behind research on the effects of disclosure via treatment [12]. This may explain why scant trauma research focuses on pre-treatment TD despite the existence of many different theories that attempt to explain the processes involved in exposure treatment.

Hundreds of studies span decades on the general construct of self-disclosure. However, conceptualizations of self-disclosure vary considerably, and there is no agreement on what the construct entails or on how it should be assessed (see [13] for a review). This may help explain the dearth of TD studies and the limitations of existing TD measures, as the following summary of PTSD-related TD studies illustrates.

Most research using TD measures employs one or two TD questions and/or measures with unknown psychometric properties. For example, Pennebaker and O'Heeron [14] generated two 3-point scale questions to survey disclosure of spouses of suicide and accidental death victims to close friends, counselors, or support groups. Other studies simply dichotomize TD or measure it with few items [15] – [18].

A few studies use more elaborate TD measures but provide no psychometric support data. Stroebe, Stroebe, Schut, Zech, and van den Bout [19] examined emotional disclosure in participants whose marital partners recently died with a 5-item measure designed to assess emotional disclosure on the loss. Southwick, Morgan, and Rosenberg [20] surveyed veterans of the Gulf War to examine the relationship between 'social sharing' and trauma symptoms. Their

'social sharing' questionnaire asked participants how frequently they disclosed their war experience with several categories of people. Hoyt et al. [21] examined the relationship between emotional disclosure and PTSD but did not tie emotions to traumatic events and asked about the likelihood of future disclosure rather than actual prior disclosure.

Studies that do provide psychometric support data for TD measures have other limitations. Mueller, Moergeli, & Maercker [22] reported that their TD scale, the Disclosure of Trauma Questionnaire (DTQ), predicted PTSD severity in a longitudinal study of crime victims. Similar to Hoyt et al. [21], their DTQ measures 'intentions' and not the extent of actual disclosure. Davidson & Moss [12] designed a scale for police officer spouses to report on officer TD. They acknowledge the limitation of asking others: there is no certainty that trauma victims are not withholding additional emotions, facts, or traumas from their spouses.

Many of these studies using untested measures of TD that are generated for each investigation suggest that the construct may be useful for understanding responses to stressful and traumatic experiences and treatment outcomes. However, a psychometrically sound measure of prior TD might move the field forward more rapidly. For example, it could clarify the inconsistent findings of narrative writing treatments for PTSD [23] – [27]. That is, participants with little prior trauma processing as indexed by TD might benefit most from these strategies. A sound TD instrument would also allow researchers to examine the effects of TD differences on all facets of trauma sequelae, and clinicians might find it useful to gauge avoidance and, possibly, resistance to exposure-based treatment.

The present study aimed to develop and psychometrically evaluate a TD measure that assesses the degree to which an individual has disclosed aspects related to a traumatic event to others. We operationalized TD as the disclosure to others of objective trauma experience and emotional responses at the time of trauma and subsequent to the trauma, because these are the elements that exposure treatments target. Although the consensus is that PTSD symptom reduction requires TD that includes emotions [28], TD of both facts and emotions may be superior [8].

A. Aims and Overview of the Investigation

The primary purpose of the investigation was to develop and evaluate the psychometric properties and factor structure of the Mississippi Trauma Disclosure Scale (MTDS). Once items were developed, they were tested in an undergraduate sample (N = 368) followed by testing in an inpatient, clinical sample (N = 64). We hypothesized that the MTDS would consist of two factors: factual and emotional domains of TD. We examined internal consistency and temporal stability of the factor scores and the total MTDS score. We also evaluated the relationship between MTDS scores and PTSD symptom severity and hypothesized that MTDS scores would be negatively correlated with PTSD symptoms. In the undergraduate sample, we hypothesized that individuals reporting sexual trauma would produce the lowest MTDS scores, that African Americans would produce lower MTDS scores than Caucasians, and that males would score lower on emotional disclosure than females – based on Smyth's [26] meta-analysis and Purves and Erwin's [29] findings on global disclosure. Several additional measures in the clinical sample tested convergent validity of the MTDS.

II. STUDY 1

A. Method

1) Participants:

A total of 368 college undergraduates were recruited from a large southern state university. Only participants who endorsed experiencing a traumatic event were included in the study. The sample consisted of 273 (74.2%) females and 95 (25.8%) males with a mean age of 19.68 (range: 18 to 49; *SD* = 3.00). The majority were Caucasians (83.2%), with African Americans (13.6%) and a small number of other ethnicities (3.0%) participating. The sample included 168 (45.7%) Freshmen, 83 (22.6%) Sophomores, 70 (19.0%) Juniors, and 47 (12.8%) Seniors.

2) Measures:

Trauma Assessment for Adults (TAA). The TAA [30] is a self-report measure that assesses the occurrence of a wide variety of traumatic events. Although psychometric data are limited, Resnick's [31] review provided support for the TAA's concurrent validity, as well as its clinical utility with adults in a mental health center. For inclusion in the study, participants endorsed experiencing a traumatic event and that their response to it involved fear, helplessness, or horror – corresponding to the *DSM-IV-TR* [32] Criterion A-2 for PTSD.

Modified PTSD Symptom Scale (MPSS). The MPSS [33] is a 17-item, self-report measure that parallels the Clinician-Administered PTSD Scale (CAPS) [34], widely considered the 'gold standard' structured clinical interview for PTSD, that queries both frequency and severity of *DSM-IV-TR* [32] PTSD symptoms. Participants completed the MPSS for their most traumatic experience. The MPSS has strong internal consistency (α = .98) and good concurrent validity with the Structured Clinical Interview for *DSM-III-R* (SCID) PTSD Module [35].

MPSS directions were modified to assess symptoms experienced the month prior to administration (versus 2 weeks) to correspond to *DSM-IV-TR* [32] PTSD Criterion E. Scoring yielded a total symptom score – the sum of frequency and severity scores for all the items.

Mississippi Trauma Disclosure Scale (MTDS). The MTDS was rationally derived with the aim of covering two domains theorized to embody

trauma disclosure to others: factual disclosure and emotional disclosure. An extensive item generation and selection process with input from 11 community mental health service providers and licensed psychologist academics resulted in a 14-item, self-report measure of previous TD. Respondents rate how much they have told others about their worst traumatic experience on a 5-point Likert scale. Higher scores reflect greater TD.

3) Procedure:

Following IRB approval, TAA, MPSS and MTDS data were collected in two cohorts in group settings. We measured the MTDS' temporal stability by having participants in the first cohort complete all measures (to reduce MTDS recall effects) a second time approximately two weeks later.

B. Results and Discussion

1) Initial Examination of MTDS Items:

Initial examination of MTDS item content and item-total correlations suggested that three items were inconsistent with the construct of trauma disclosure: (a) "Have you become emotionally upset while discussing the traumatic event with others?," (b) "Have you described to others changes in your daily routine as a result of having experienced the event?," and (c) "Have you described to others thoughts of worry, concern, etc. that you now have as a result of the traumatic event?" These items were deleted for subsequent analyses. Exploratory analyses conducted both with and without the three items showed they had no effect on internal consistency or temporal stability.

2) Principal Components Analysis:

Participants' responses were subjected to a principal components analysis (PCA) with oblique oblimin rotation. A Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were calculated in order to determine the appropriateness of the data set for PCA [36]. Results showed that the Bartlett's test of sphericity was significant (p < .001) and the KMO was .93. Therefore, the data appeared to be appropriate for PCA.

The PCA yielded a two-component solution, accounting for 67.3% of the total variance with eigenvalues of 6.17 and 1.23. Pattern matrix factor loadings of MTDS items on each of the two components after rotation appear in Table 1. Based on factor loadings, MTDS items 1, 4, 5, 7, 8, and 10 were selected for component 1, 'factual disclosure,' and items 2, 3, 6, 9, and 11 were selected for component 2, 'emotional disclosure.' Items 2 and 3 loaded similarly on both components, but were selected for component 2 because their content fit better with emotional disclosure. As predicted, the two components were highly related, r = .48. The PCA results support the conceptual framework used in designing the MTDS and provide some initial validation to the construct.

3) Internal Consistency:

Internal consistency was adequate with an alpha of .92 for the MTDS total score and alphas of .89 and .86, respectively, for factual and emotional disclosure scores.

4) Temporal Stability:

The subset of the current sample (n = 177) that completed the MTDS twice approximately two weeks apart (M = 14.38 days; range = 13 - 28) showed sufficient test-retest reliability, with correlations of .79, .82, and .79 for the total, factual disclosure, and emotional disclosure scores, respectively.

5) Validity:

Correlations examined hypothesized relationships between MTDS scores and PTSD symptoms, traumatic event categories, and demographic variables. After excluding participants receiving treatment for PTSD symptoms (n = 61), all three MTDS - MPSS correlations were in the expected negative direction with correlations of -.13, -.05, and -.17 for the total, factual disclosure, and emotional MTDS scores, respectively (p < .05 for total and emotional scores). The modest correlations and the nonsignificant finding for factual disclosure were likely due at least in part to attenuation by positively skewed MPSS scores (skewness = 1.76, n = 307, SE = 0.127).

Table 2 shows relationships between MTDS scores and traumatic event categories. Participants endorsing the three sexual abuse age categories yielded the lowest MTDS total, factual, and emotional disclosure scores (with the exception of the military/combat experience category that was endorsed by only 1 participant). The total MTDS score of the three sexual abuse categories combined was lower than the total MTDS scores for the other traumatic event categories (with the exception of the military/combat experience category; t range = 2.32 to 6.43, p < .05), supporting the hypothesis that sexual abuse would lead to less MTDS disclosure than non-abuse trauma. Sexually abused women give several reasons for avoiding trauma disclosure, including denial, avoidance, stigmatization, and negative reactions from others [37].

The sole significant difference in MTDS scores across demographics (Table 3) was that Caucasians had higher total and factual disclosure scores than did African Americans – consistent with previous research that indicates African Americans tend to keep psychological matters to themselves [38], [39]. Other ethnicities were not analyzed due to small Ns.

C. Limitations

Study 1 limitations include limited generalizability from an undergraduate student sample from one university, and, with heterogeneous traumatic events and type of exposure (e.g., direct versus indirect), disclosure-symptom relationships

could possibly vary across these dimensions. Also, neither general tendency to share information with others nor availability of social support – potential moderators of disclosure – were assessed.

III. STUDY 2

A. Method

1) Participants:

The sample was 64 substance abuse treatment center inpatients who participated in a larger treatment study for PTSD. Participants endorsed experiencing a traumatic event and met criteria for PTSD (n = 54) or sub-syndromal PTSD (n = 10). The sample consisted of 44 (68.8%) females and 20 (31.2%) males with a mean age of 34.9 (range: 19 to 57; SD = 10.32). Most were Caucasian (96.9%) with the remainder African American (3.1%).

2) Measures:

Life Events Checklist (LEC). The LEC [34] is a 17-item checklist that assesses exposure to several traumatic events. It has adequate 1-week test-retest reliability (r = .82) and good concurrent validity with an established measure of traumatic event exposure [40]. Participants identified their most traumatic event and whether their response to that event involved intense fear, helplessness, or horror in order to assess *DSM-IV-TR* [32] Criterion A-2 for PTSD.

Modified PTSD Symptom Scale (MPSS). The MPSS [33] was used as in Study 1. To diagnose PTSD, a symptom was considered present with a frequency score of at least 1 and a severity score greater than 1 – comparable to standard scoring for the CAPS [34]. Participants received a diagnosis of sub-syndromal PTSD if all *DSM-IV-TR* [32] criteria except C or D were met.

Mississippi Trauma Disclosure Scale (MTDS). The final 11-item version of the MTDS created in Study 1 was used again (see Table 1 for scale items).

Distress Disclosure Index (DDI). The DDI [41], a 12-item, self-report measure, assesses the tendency to conceal versus disclose psychological distress. The authors describe the DDI as assessing one bipolar dimension, with high and low scores representing frequent distress disclosure and concealment, respectively. The DDI has good internal consistency (α = .93) and temporal stability (r = .80, 2-month interval), and concurrent validity is well-established with measures of self-disclosure, social support, extraversion, and self-concealment.

Interpersonal Trust Questionnaire (ITQ). The ITQ [42], a 48-item, self-report measure of the ability to use social support effectively, contains three scales: fear of disclosure (FOD), social coping (SC), and social intimacy (SI). Study 2 used the FOD and SC scales (the SI scale may vary by changes in friendship patterns). Forbes and Roger [42] reported alpha coefficients of .88 and .77, respectively, for the FOD and SC scales and found expected relationships with measures of personality, coping, and social support as evidence for concurrent validity.

Attitudes Towards Emotional Expression Scale (ATEE). The ATEE [43] is a 20-item, self-report measure of attitudes towards expressing emotions, with higher scores representing more negative attitudes towards emotional expression. The ATEE has good internal consistency (α = .90) and correlates negatively with social support seeking behavior.

Sense of Support Scale (SSS). The SSS [44] is a 21-item, self-report measure of global perceptions of the quantity and quality of available (not actually received) social support. The SSS has adequate internal consistency (α = .86), temporal stability (r = .91, 2-week interval), and concurrent validity (i.e., it correlates with other social support measures and measures of hardiness and approach-coping).

3) Procedure:

Participants completed all measures prior to the start of the associated treatment study.

B. Results and Discussion

1) Internal Consistency:

Internal consistency was very similar to Study 1 with an alpha of .92 for the MTDS total score and alphas of .89 and .84 for factual and emotional disclosure scores, respectively.

2) Validity:

Correlations tested hypothesized relationships between MTDS scores and PTSD symptoms. Unlike Study 1, all three r's (-.30, -.32, and -.26 for the total, factual disclosure, and emotional MTDS scores, respectively) were significant (p < .05), and they tended to be larger despite much less power.

Correlations between MTDS scores and measures predicted to be either positively or negatively related to the construct of trauma disclosure tested convergent validity (Table 4). MTDS scores were positively correlated with instruments designed to measure distress disclosure, social coping, and one's perceptions of the quantity and quality of social support, with all but one of these correlations reaching statistical significance. These results were expected, given the assumed similarity between the constructs of trauma disclosure and distress disclosure, as well as the assumption that social support would play a role in one's decision to disclose to others aspects of a traumatic event.

Similarly, 5 of 6 correlations between MTDS scores and measures for fear of disclosure and negative attitudes towards emotional expression were significant and negative, findings consistent with hypotheses. However, one puzzling finding was that MTDS emotional and factual subscale scores correlated almost identically with the ATEE. Possibly, even the disclosure of factual aspects of a traumatic event will elicit an emotional response.

C) Limitations

The relatively modest sample size of 64 and homogeneity of mostly Caucasian substance abuse treatment inpatients limits generalizability of results, and other populations need to be studied. Also, both Study 1 and Study 2 used self-report questionnaires: structured interviews would strengthen confidence in participants' responses.

IV. CONCLUSIONS

The results from both studies, which sampled very different populations, were consistent in supporting the MTDS' factor structure, internal consistency, and construct validity. In addition, Study 1 showed good test-retest reliability, and Study 2 supported convergent validity with five other measures.

The relationship between MTDS scores and PTSD symptoms, crucial to the construct validity and utility of the MTDS, was consistent with 100% negative correlations. However, significance varied between samples. Study 2's clinical sample MTDS scores accounted for 6.7% to 10.2% of MPSS symptom variance, predictably much higher values than those found for the undergraduate sample and likely a better representation of the MTDS' utility.

It is important to note that the MTDS measures disclosure to others; it does not attempt to measure 'self-disclosure.' That means that a low MTDS score does not preclude significant prior internal emotional processing of a trauma. Conversely, a high MTDS score could possibly occur along with only 'shallow' prior emotional processing. Internal processing may be just as or possibly much more important than disclosure to others for predicting overall emotional processing of traumas and, therefore, long-term outcome following trauma exposure. Development of a measure of internal processing – or a modification of an MTDS-like measure that incorporates self-disclosure – should be a next step toward accounting for more PTSD symptom variance and improving the clinical utility of disclosure measurements. Future studies should also test the MTDS' utility across specific trauma experiences.

The psychometric support from these initial studies plus the lack of other measures of prior trauma disclosure with such support suggests that the MTDS may prove useful for illuminating the role that traumatic event disclosure plays in all facets of trauma research and for clinical applications.

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Table 1

Pattern Matrix Factor Loadings of MTDS Items

MTDS Item	Component 1	2
1. Have you described to others the details of the physical setting (time, place, etc.) in which the traumatic event occurred?	.92	-.20
2. Have you described to others the emotions that you experienced during the traumatic event?	.63	.27
3. Have you described to others the emotions that you experienced during the aftermath of the traumatic event (any emotions that you had at any time after the traumatic event that were somehow related to the event)?	.47	.45
4. Have you described to others the actions that you engaged in during the traumatic event and its aftermath?	.79	.06
5. Have you described to others how other people acted during the traumatic event and its aftermath?	.73	.02
6. Have you described to others how the event has changed your emotional life?	-.13	.95
7. Have you described to others the details of what occurred during the traumatic event and its aftermath?	.73	.18
8. Have you described to others the physical features of the cause of the traumatic event (whether it be a person, natural disaster, something disturbing that you witnessed, etc.)?	.84	-.12
9. Have you described to others feelings that you have about the traumatic event?	.39	.57
10. Have you described to others exactly what you sensed (saw, felt [in terms of physical contact], heard, etc.) during the traumatic event and its aftermath?	.74	.13
11. Have you described to others your deepest, most intimate feelings concerning the traumatic event?	.15	.78

Table 2

Mean MTDS Scores by Traumatic Event Category

Traumatic Event	*N*	*M* for MTDS Factual	*M* for MTDS Emotional	*M* for MTDS Total
War	1	9.00 (.00)	5.00 (.00)	14.00 (.00)
Accident (MVA/other)	59	23.86 (5.49)	16.48 (5.15)	40.34 (9.82)
Natural Disaster	26	20.62 (6.85)	13.08 (5.35)	33.69 (11.55)
Sexual Abuse Under Age 13	9	14.89 (6.07)	12.44 (5.03)	27.33 (9.21)
Sexual Abuse Under Age 18	24	14.71 (5.79)	13.00 (5.12)	27.71 (10.18)
Sexual Abuse Age 18+	9	14.89 (4.94)	12.89 (5.78)	27.78 (10.20)
Attacked w/ Weapon	12	22.20 (5.04)	13.83 (5.46)	36.25 (9.77)
Attacked w/o Weapon	14	23.00 (6.60)	15.29 (5.70)	38.29 (11.55)
Other Actual Injury	13	24.31 (4.70)	15.69 (3.38)	40.00 (6.92)
Other Threat of Injury	36	20.39 (6.50)	14.42 (5.37)	34.81 (11.35)
Witnessed Injury/Death	34	20.71 (5.96)	14.74 (4.27)	35.44 (9.05)
Other Extreme Stress	75	19.68 (5.65)	15.89 (5.24)	35.57 (10.19)
Friend/Family Killed or Murdered	56	19.16 (5.52)	15.21 (4.89)	34.38 (9.80)

Note. Standard deviations are in parentheses.

Table 3

Mean MTDS Scores by Demographic

Demographic		*N*	*M* for MTDS Factual	*M* for MTDS Emotional	*M* for MTDS Total
Gender					
	Females	273	20.00 (6.44)	15.26 (5.18)	35.25 (10.93)
	Males	95	21.15 (5.88)	14.11 (5.07)	35.25 (9.69)
	t		1.53	1.88	.00
Race					
	Caucasian	306	20.59 (6.17)	15.21 (5.09)	35.80 (10.37)
	African American	50	18.44 (6.77)	13.98 (5.23)	32.42 (11.28)
	t		2.25*	1.58	2.11*

Notes. Standard deviations are in parentheses. * $p < .05$.

Table 4

Correlations Testing MTDS Convergent Validity

Measure	MTDS Factual	MTDS Emotional	MTDS Total
DDI	.31*	.43**	.38**
ITQ Social Coping	.28*	.26*	.28*
SSS	.23	.28*	.27*
ITQ Fear of Disclosure	-.25*	-.23	-.25*
ATEE	-.39**	-.40**	-.41**

Notes. * $p < .05$. ** $p < .01$.