

The Tonic Immobility Questionnaire: **Exploratory Factor Analysis with a Sample of Undergraduate Students**

Murray Abrams, B.A. Hons., R. Nicholas Carleton, M.A., and Gordon J. G. Asmundson, Ph. D. Anxiety and Illness Behaviours Laboratory, University of Regina

Introduction

- Tonic immobility (TI) is a temporary state of motor inhibition believed to occur in situations involving intense fear (Gallup & Maser, 1977). TI presents as a catatonic-like immobility with muscular hyperor hypo-tonicity, suppressed vocalization, eve closure, and tremors. TI is well documented in the animal literature, but little research explores TI in humans.
- TI has been reported during sexual assault, wherein victims describe an inability to move or call out during an attack (i.e., rape-paralysis; Galliano et al., 1993; Suarez & Gallup, 1979). There are also instances of fear-induced 'freezing' among persons involved in air, naval, and similar disasters (Leach, 2004).
- Currently, the only self-report measure for human TI is trauma-specific (i.e., sexual assault; Forsyth et al., 2000).
- This study had two main purposes

Table 1: Scale Items and Loadings

- To assess the factor structure of a new selfreport measure, the Tonic Immobility Questionnaire (TIQ), designed to assess TI across a range of traumatic events; and,
- To explore sub-factor correlations with constructs considered risk factors for posttraumatic stress disorder (PTSD).

Method

- Participants were 78 undergraduates (17 men, ages 18-28. M = 20.6: SD = 3.0. and 61 women. ages 17-33, M = 20.1; SD = 2.8) who reported immobility during a traumatic event.
- The proportion of men (22%) and women (78%) comprising the TI sub-sample was not statistically different from the larger sample from which they were drawn (n = 285, 25% men, 75% women).
- Participants completed a preliminary 21-item Likert scale TIQ (based on the existing measure of TI for sexual assault; Forsyth et al., 2000) anchored from 0 (Not at all) to 4 (Very much), along with several other trauma-related measures (i.e., peritraumatic dissociation, anxiety sensitivity).
- Exploratory Factor Analysis (EFA) was performed using TIQ item responses following recommendations of Costello and Osborne (2005): principal axis factoring with promax rotation and Kaiser normalization; eigenvalues > 1.0; initially, items were removed where communalities < .4, loadings \leq .45, and cross-loadings \geq .32.
- Correlational analyses assessed relationships among TIQ factors and measures of constructs believed to be risk factors associated with PTSD.

Results

- EFA resulted in a 13-item, three-factor solution. accounting for 61% of the variance, with factors conceptualized as immobility, detachment, and fear.
- The immobility factor (43% of the variance) comprised items paralleling TI features described in animal research (e.g., "my legs felt paralyzed"; "my body felt frozen"; "my voice was weak").
- The detachment factor (10% of the variance) included items such as "I felt faint or light-headed" and "my body felt unreal".
- The fear factor (8% of the variance) included items such as "I felt horrified" and "I felt helpless".
- Since the sample was not balanced for sex (78% female) independent t-tests were conducted on TIQ factor and total scores to assess for differences. No significant differences were found for sex, with the exception of the fear subscale where woman scored higher than men, $M_{\rm D}$ = 2.25, SE = .80, t(76) = -2.83, p $< .01, r^2 = .10,$
- Significant moderate correlations were found between TIQ total and subscale scores with measures of constructs associated with PTSD (see Table 3 below).

Table 3: Measu

Immobility	М	SD	Loading
9. My legs felt paralyzed	1.76	1.35	.97
8. My arms felt paralyzed	1.76	1.36	.96
14. My body felt stiff and rigid	1.77	1.42	.69
7. My muscles felt weak	2.27	1.34	.68
6. My body felt frozen	2.55	1.13	.61
10. My voice was weak (e.g., I had difficulty speaking or calling for help)	1.68	1.44	.60
Detachment			
17. I felt faint or light-headed	1.64	1.43	.93
16. I had trouble keeping my eyes open	.79	1.23	.79
20. My body felt unreal	1.75	1.53	.70
5. I thought I was going to die	1.10	1.37	.44
Fear			
4. I felt horrified	2.78	1.27	.85
2. I felt frightened	3.10	1.10	.75
		1 = 0	

Table 2: TIQ subscale means and standard deviations				
	α	М	SD	n
Immobility	.90	11.79	6.58	75
Detachment	.83	5.29	4.55	78
Fear	.81	8.82	3.03	77
TIQ Total	.90	25.76	11.50	78

Measures

PCL-C: PTSD Checklist – Civilian Version (Weathers, et al., 1994) **DES-II**: Dissociative Experiences Scale-Revised (Carlson & Putnam, 1993) ASI: Anxiety Sensitivity Index (Peterson, & Reiss, 1992) PDEQ: Peritraumatic Dissociative Experiences Scale (Marmar, et al., 1998)

Immobility Detachment Fear

Total * Correlation is

Table 4: Inter-Subscale Correlations

Subscale Immobility

Detachment

Fear

* Correlation is significant at the 0.01 level (2-tailed)

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Discussion
• In line with Fusé and colleagues (2006), we anticipated that TI in humans may be best represented with a two-factor solution reflecting immobility and fear. Instead, we found a three factor solution comprising immobility, detachment, and fear.
• Types of traumas in which TI was reported covered a wide range of events, including motor vehicle accidents, sexual and physical assaults, and exposure to death (e.g., unexpected death of a loved one).
• Reasons for sex differences on the TIQ fear subscale are unclear. This finding may be consistent with epidemiological reports that females are more likely to develop PTSD (e.g., Stein, et al., 2000).
• Moderate to high correlations between TIQ subscale scores and the PDEQ, rather than the DES-II, suggest that the phenomenology of TI may include high levels of peritraumatic dissociation. This more "cognitive" dimension may owe to the broad range of traumatic events reported in the current sample.
• Future research directions include further exploration of the TIQ factor structure across a range of trauma contexts; potential development of a cut-off score for identifying elevated risk for PTSD; and, investigation of the cognitive states antecedent to TI.

re Correlations				
	ASI	PCL-C	DES-II	PDEQ
	.15	.32*	.36*	.50*
	.39*	.42*	.20	.65*
	.38*	.33*	.18	.50*
	.33*	.46*	.35*	.66*
significant at the 0.01 level (2-tailed).				

Detachment	Fear	TIQ Total
.47*	.49*	.89*
-	.46*	.78*
	-	.74*