

Reliability and Validity of the Vicarious Trauma Organizational Readiness Guide (VT-ORG)

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Highlights

- First responders and victim assistance workers are highly exposed to vicarious trauma (VT) or the exposure to the traumatic experiences of others.
- Vicarious traumatization, or the negative impacts of VT, may lead to serious individual and organizational consequences if not addressed by first response and victim assistance agencies.
- The Vicarious Trauma Organizational Readiness Guide (VT-ORG) assesses responses and preparedness regarding VT in these agencies and provides a score on five scales of organizational health.
- The VT-ORG was tested on 3,018 individuals from 13 agencies and was found to have excellent internal consistency and criterion validity.
- The VT-ORG may be used by organizations to assess their responses and preparedness regarding VT and to inform organizational changes that result in a more vicarious trauma-informed organization.

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Abstract The Vicarious Trauma Organizational Readiness Guide (VT-ORG) is an assessment of an organization's readiness to address vicarious trauma (VT), which is exposure to the traumatic experiences of people served. This study reports on the psychometric properties of the VT-ORG. Employees of first responder agencies (e.g., law enforcement, fire, emergency services) and victim assistance agencies are at a high risk for vicarious traumatization, which can lead to PTSD, substance use, and suicidal ideation, among other negative impacts. Organizations that do not address VT may see such effects as employee turnover, reduced efficiency, and negative work environments. The VT-ORG is an assessment tool designed to help organizations complete the first step of organizational change—conducting a needs assessment. Study participants were 3,018 employees across 13 first responder and victim assistance agencies who completed the 67-item VT-ORG and

additional measures for evaluation of its validity and reliability. The VT-ORG was found to have excellent internal consistency (Cronbach's $\alpha = .98$). A structural equation model demonstrated that the subscales of the VT-ORG predicted criterion measures of turnover intention, compassion satisfaction, and organizational resilience, with an overall model fit of CFI = .99, RMSEA = .053. This study found the VT-ORG to be a reliable and valid assessment of organizational responses to vicarious trauma.

Keywords Vicarious trauma · First responders · Victim services · Victim assistance · Psychometric · Organizational assessment

Introduction

Vicarious trauma (VT) can be defined as the exposure, by empathic connection, to the traumatic experiences of others (Molnar et al., 2017). Employees of agencies that respond to victims of violence, such as law enforcement, fire departments, emergency medical services (EMS), and victim assistance agencies, are particularly exposed to VT given the extreme situations that they encounter and the victims they serve (Brunet & Best, 2010). The process that an individual may undergo when negatively impacted

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by VT is termed vicarious traumatization (McCann & Pearlman, 1990). Here, the distinction is important—just as *traumatization* is the process of being impacted negatively by *trauma*, vicarious traumatization is the process of internally incorporating the experience of VT in a negative way. Central to this distinction is that for employees in these professions, VT exposure may be an inevitable occupational challenge of their work, but the process may not always lead to negative consequences or vicarious traumatization. Organizations can mitigate the potential for vicarious traumatization by being proactive in addressing VT.

Evidence of the Need for Organizations to Address Vicarious Trauma

For employees who respond to violent events and/or those who have been victimized, the occupational challenge of VT is commonplace. Among a sample of police officers, 98% reported exposure to a dead body, the most common type of event, followed by making a mistake that injures or kills a bystander (97.7%), seeing a badly beaten adult (95%), or seeing a decaying corpse (91%; Brunet & Best, 2010). For emergency medical services, the most common critical incidents were watching someone die, encountering the body of someone recently dead, making a death notification, encountering a badly beaten adult, and responding to a scene involving someone known to the ambulance crew (Donnelly & Bennett, 2014).

The key distinction between vicarious (also called indirect) trauma and direct trauma is that for vicarious trauma, the individual-in-question's life is not directly endangered (McCann & Pearlman, 1990). However, it is evident from the above descriptions of these critical incidents that the line between VT and direct trauma can be thin. Furthermore, reactions to vicarious trauma appear to follow a similar process to the reaction to direct trauma. A *change in worldview* that can include increased awareness of the dangers of the world and decreased feelings of safety has been consistently documented for vicarious trauma (McCann & Pearlman, 1990). This mirrors the cognitive changes that are the defining feature of the *Shattered Assumptions* theory of trauma reaction (Janoff-Bulman, 2010). The neurological reactions to VT can also follow a similar pathway through the limbic system as direct exposure to trauma (Tyler, 2012). Indeed, the Diagnostic and Statistical Manual version 5 criteria for diagnosing Post-traumatic Stress Disorder includes VT and recognizes the unique exposure facing first responders: “[A4] Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse)” (American Psychiatric Association, 2013).

This chronic and cumulative exposure leads to a greatly increased risk of behavioral health conditions. A meta-analysis of rescue workers showed that 10% of the 20,424 subjects met diagnostic criteria for PTSD (Berger et al., 2011), compared with the rate of 4% reported among the general population (Kessler et al., 2011). Responders to violent events and/or victims are also at significantly higher risk of substance use (Chopko, Palmieri, & Adams, 2013; Ménard & Arter, 2013), suicide or suicidal ideation (Carpenter et al., 2015; Violanti, 2004), and depression (Chiu et al., 2011; Wang et al., 2010). The stress associated with first responder work, combined with the significant risk for injury and the often hazardous environments, can also lead to significant physical health problems that disproportionately affect first responders (Bond et al., 2013; Sterud, Ekeberg, & Hem, 2006).

Organizational Responses to Vicarious Trauma

Beyond individual impacts, VT can influence the organization. For example, Perez, Jones, Englert, and Sachau (2010) showed that individuals with high secondary traumatic stress—a potential outcome of VT with symptoms similar to PTSD (Canfield, 2005), also used interchangeably with vicarious traumatization—can show decreased ability to work independently, general distrust of coworkers, and are increasingly likely to be looking for another job. VT can also lead to decreased team cohesion and communication (Knight, 2013). Burnout, another condition frequently linked to VT (Canfield, 2005), was found to have a relationship to counterproductive work behaviors such as loafing, absenteeism, and deliberate sabotage in police officers (Smoktunowicz et al., 2015). Similarly, burnout can result in loss of productivity, loss of morale, and increased safety issues (O’Connell & Kung, 2007).

To date, the onus of coping with VT has largely remained on the individual. A number of individual strategies for direct trauma exposure have been shown to aid recovery from VT, such as Eye Movement Desensitization and Reprocessing (Keenan & Royle, 2007) and Stress Inoculation Training (Meichenbaum & Deffenbacher, 1988). However, VT, as with any occupational challenge, must be addressed at the organizational level as well. There are few programs that address the issues associated with VT from an organizational perspective. Some, like trauma-informed supervision, have been shown to decrease secondary traumatic stress (Berger & Quiros, 2014). Others are more controversial. Critical Incident Stress Management (CISM; Everly, Flannery, & Eyer, 2002) is particularly prevalent in first response agencies (Deville & Cotton, 2003), despite a lack of evidence of effectiveness in preventing PTSD, and even some evidence that it can inhibit natural recovery from PTSD

(Rose, Bisson, Churchill, & Wessely, 2002). However, other research suggests CISM may serve a helpful role in reducing vicarious traumatization (Gilbert, 2018) and compassion fatigue, another condition highly related to VT (Wee & Myers, 2003).

An organization taking proactive measures to address VT can serve both as a pragmatic approach to improving efficiency and morale and as an ethical responsibility of the employer to protect its employees. Organizations that grapple with issues of trauma have long strived to become more “trauma-informed,” where considerations for the impacts of trauma are incorporated into an organization’s functioning, service delivery, infrastructure, and employee relations (Center for Substance Abuse Treatment, 2014). Organizations dealing with vicarious trauma should strive to be similarly “vicarious trauma-informed” (VT-informed).

A Vicarious Trauma-informed Organization

In the development of the VT-ORG assessment tool, the conceptualization of a VT-informed organization was shaped by industrial and organizational psychology theories. These included Galbraith’s star model, which examines five structures by which an organization should design and implement changes: strategy, structure, processes, reward systems, and people policies (Galbraith, 2002). This model, which was developed for use in the information technology (IT) industry, was combined with relational coordination, a model of task coordination designed for situations where “work is highly interdependent, uncertain and time-constrained” (Gittell, 2006, p. 75). Working with representatives from a diverse group of organizations of fire, emergency medical, law enforcement, and victim assistance agencies, being strong in five organizational strategies was identified as being integral to an organization ready to address vicarious trauma: (a) Leadership and Mission, (b) Management and Supervision, (c) Employee Empowerment and Work Environment, (d) Training and Professional Development, and (e) Staff Health and Wellness.

“Leadership and Mission” incorporates the overall direction of the organization and actions of members of the highest level of the hierarchy, factors that can allow organizations to effectively carry out their mission (Gillet, Cartwright, & van Vugt, 2011) and potentially decrease employee turnover (Jaramillo, Grisaffe, Chonko, & Roberts, 2009). “Management and Supervision” relates to middle levels of hierarchy and the applications of supervision policies to the actual work of the organization. In a VT-informed organization, these factors can encourage collaboration (Lukens et al., 2004) and reduce burnout (Ângelo & Chambel, 2015).

“Employee Empowerment and Work Environment” includes formal and informal peer-level practices that address VT and lead to a sense of inclusion for workers. These important factors can increase collaboration among employees (Bednar, 2003), reduce turnover (Gormley & Kennerly, 2011), and encourage the positively valenced outcome of VT: compassion satisfaction (Kulkarni, Bell, Hartman, & Herman-Smith, 2013). “Training and Professional Development” considers the extent to which VT is addressed in the onboarding process and in ongoing career development opportunities. Research has shown that VT-related training can improve an individual’s ability to manage the impacts of VT and encourage compassion satisfaction (Andersen et al., 2015). “Staff Health and Wellness” incorporates specific programs and policies addressing individuals’ physical and mental health and whether those are incorporated into work time rather than added to the workers’ personal time.

The VT-ORG operates on the evidence-informed assumption that when each of these five organizational strategies is integrated into a workplace’s programs, policies, and practices, that VT-informed organization will see benefits in their employees’ health and wellbeing, as well as in their ability to function and complete their organizational missions. However, introducing new elements always requires a process of organizational change.

A Tool for Organizational Change

Practice recommendations for enacting organizational change begin with an assessment of the organization’s current needs and strengths (Maher, 2012); a key to such an assessment is having a reliable and valid measurement tool. The Vicarious Trauma Organizational Readiness Guide (VT-ORG) is a tool designed to assess an agency’s preparedness for addressing vicarious trauma, or the extent to which it is a VT-informed organization. The VT-ORG can be used to highlight both existing strengths and areas needing improvements, including specific strategies for addressing VT and general areas of organizational health that, when combined, can be instrumental in mitigating or preventing the deleterious effects that can result from VT.

The process of an organization taking better care of workers’ health is becoming increasingly data-driven (Meissner & Fallon, 2015; Uchida & Thurnauer, 2015). An assessment tool must be firmly grounded in theory and fit neatly into an organizational change framework. Furthermore, to underscore the importance of enacting the changes recommended by such an assessment, the results should have established relationships to indicators of individual and organizational health. The assessment itself needs to be evidence-based as determined through an

empirical evaluation of its reliability and validity. While there is a related assessment available, the Secondary Traumatic Stress Informed Organizational Assessment (STSI-OA; Sprang, Ross, Miller, Blackshear, & Ascienzo, 2016), used by child welfare, mental health professionals, and others, the VT-ORG differs in that it focuses not only on specific practices that address VT, but more broadly on the extent to which an organization's general practices may help or hinder the ability to prevent or mitigate the impacts of VT-related outcomes. This assessment is also the first to incorporate relational coordination theory and Galbraith's star model into the design to increase its ability to measure theory-based constructs of organizational health. It is also the first to be developed in conjunction with a toolkit designed to address the need areas identified by the assessment—the Vicarious Trauma Toolkit (<https://vtt.ovc.ojp.gov>). This free online resource contains tools, examples, and guides to help organizations strengthen their ability to protect their employees from the impact of VT, including the VT-ORG assessment tool, scoring instructions, and report templates.

The goal of the current study was to establish the psychometric properties of the VT-ORG. Reliability of the VT-ORG was examined by investigating its internal consistency. Accurate representation of the theory-derived factor structure was confirmed using confirmatory factor analysis. To assess its criterion validity, the relationships between the VT-ORG and other indicators of individual and organizational functioning were estimated. It is hypothesized that (a) the VT-ORG will demonstrate acceptable internal consistency, (b) the latent factor structure will conform to the expected 5-factor structure that reflects the theory-based construction of five areas of organizational health, and (c) the VT-ORG will significantly predict other valid and reliable measures of individual and organizational health.

Method

Procedure

Data collection occurred concurrently with early-access pilot testing of the Vicarious Trauma Toolkit. All early-access agencies were eligible to participate in this study and received an invitation email with instructions for how to participate. Individual participants were employees of one of these agencies. The only other inclusion criteria were for participants were to be age over 18 and English-speaking for consent and communication purposes. Study personnel ensured that agencies met inclusion criteria prior to sending invitations and provided access to the survey to those that agreed to participate.

Vicarious Trauma Toolkit project staff collated the VT-ORG responses and generated a customized report, comprising recommendations for changes and guidelines for implementing these changes, for each participating organization. Having study staff collect the data and create the reports for the agencies, rather than the agencies doing it themselves, was presented as an incentive for participation in the study. Representatives from within the agencies distributed the survey link to their employees via email. No monetary compensation was involved. Information about the study and informed consent documentation were built into the survey to ensure that every participant had sufficient information to give informed consent. All data were gathered through the survey. Prior to analysis, data were scrubbed of all identifying information (IP addresses, GPS coordinates, etc.) and maintained on a password-protected cloud storage system. The Institutional Review Board at Northeastern University approved all procedures.

Participants

Data collection occurred between February and October 2017. A total of 3,018 individuals from 14 organizations participated—8 law enforcement agencies (including police and sheriff departments), 5 victim assistance agencies (including domestic violence shelters, rape crisis centers, and victim advocacy groups), and 1 EMS agency. Organizations varied substantially in terms of size, including two law enforcement organizations with approximately 2,500 and 5,000 employees. For the remaining 11 agencies, average size was 225 (*SD*: 263, median: 77, range: 36–767). Eight agencies were located on the East Coast—6 Southeast, 2 Northeast 1 Mid-Atlantic—2 were located on the West Coast, and 1 in the Midwest and 3 in the Southwest. Six agencies were located in suburban settings, 5 urban, with 3 agencies covering counties that comprised urban, rural, and suburban settings. The resulting distribution of participants is unbalanced due to the overrepresentation of law enforcement participants and underrepresentation of organizations representing rural settings.

Table 1 shows individual demographic information by discipline. While ANOVA and chi-square analyses showed significant differences between disciplines in all demographic variables ($p < .05$) except for race ($p = .98$), effect sizes were low indicating significance of the differences may be mostly attributable to the large sample size. There appeared to be substantial differences in the distribution of genders and education between the disciplines, with participants from victim assistance more likely to be female and to have more education than participants from law enforcement and EMS; but these are well-known

Table 1 Descriptive statistics for sample demographics

	Emergency medical services	Law enforcement	Victim services
<i>N</i>	28	2793	197
Age: mean (<i>SD</i>) median	38.2 (10) 35	42.9 (9.9) 43	39.8 (12.3) 37.5
Experience (years): mean (<i>SD</i>) median	6.9 (6) 7	14.01 (8.9) 14	6.2 (7.4) 3.5
Gender			
Female—Male—Other/blank	21%—71%—8%	25%—69%—6%	85%—8%—7%
Race			
Asian	0%	2%	1%
African American	0%	13%	15%
White	93%	72%	72%
Other/blank	7%	14%	12%
Ethnicity			
Hispanic—Not Hispanic—Blank	0%—93%—7%	16%—75%—8%	9%—83%—9%

demographic differences that are representative of their respective disciplines.

Measures

The assessment tool being evaluated in this study is the Vicarious Trauma Organizational Readiness Guide (VT-ORG), a self-report measure that assesses employees' perceptions of the extent to which their organization is VT-informed, including the quality of organizational responses to VT. Responses are on a Likert-type scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always) with a not applicable (N/A) option for each item. There are discipline-specific versions of the VT-ORG, with minor language changes to best reflect the vocabulary of the discipline (e.g., "command staff" used in place of "my supervisor" for the fire department VT-ORG vs. the victim services VT-ORG). There are 63 base items that are seen by all disciplines. The Victim Assistance version has two additional unique items: the Law Enforcement Version and EMS versions each have 1 unique item. Unique items pertained specifically to the given discipline; for example, the first responder versions inquire about line-of-duty deaths and commonly used organizational strategies such as CISM. Items regarding the usage of CISM were included given its use among first response agencies and are not meant as an endorsement of the program. Each version of the VT-ORG can be obtained from the VTT: <https://vtt.ovc.ojp.gov/what-is-the-vt-org>.

The Professional Quality of Life Scale (ProQOL) is a 30-item self-report assessment that produces scores on three subscales: Burnout, Secondary Traumatic Stress, and Compassion Satisfaction (Stamm, 2010). Concurrent validity was established with other measures of anxiety, depression, social functioning, and somatic symptoms among trauma nurses (Yadollahi, Razmjooei, Jamali, Niankan, & Ghahramani, 2016). The measure was found to have predictive validity for PTSD diagnoses among nurses in forensic hospital settings (Lauvrud, Nonstad, &

Palmstierna, 2009). This measure was selected to examine the individual impacts of VT.

The Organizational Efficacy Scale (OES) is a 17-item self-report scale that generates an overall organizational efficacy score as well as subscale scores on Collaboration, Mission and Future, and Organizational Resilience (Bohn, 2010). The OES has been shown to have convergent validity with the Collective Teacher Efficacy Questionnaire, a well-established measure of collective efficacy at an organizational level from the field of school psychology that can predict job stress and burnout (Schmitz & Schwarzer, 2000). This measure was selected to examine the organizational impacts of VT.

The Turnover Intention Scale (TIS) is a measure that has shown predictive validity for job turnover among emergency communications specialists in an unpublished dissertation (Liu, 2005). A validation study indicated that the 6-item version utilized by our study was predictive of turnover in emergency communications workers, such as 9-1-1 operators (Bothma & Roodt, 2013). This measure was also selected to examine the potential organizational impact of VT.

Data Analyses

Cronbach's α was calculated as a measure of scale reliability (Cronbach, 1951) to address the first research question—the internal consistency of the VT-ORG. Cronbach's α is a measure of reliability and can be used with cross-sectional data. In general, α above .9 is considered excellent, .8 to .9 is considered good, .6 to .8 is questionable, and below .6 could be considered poor (DeVellis, 2011).

Confirmatory factor analyses (CFA) addressed the second hypothesis, confirming that the VT-ORG had a latent factor structure based on the proposed five subscales. CFA tests the hypothesis that the items from a given measure conform to an expected latent variable structure (Tabachnick & Fidell, 2012). Confirmatory, rather than

exploratory, factor analysis was chosen because the assessment has a planned factor structure that this study is attempting to confirm, rather than exploring an unknown underlying factor structure. CFA produces factor loadings, or coefficients that represent the strength of the relationship between individual items and the latent variables or subscale, and estimates of model fit, which measure the extent to which the hypothesized model matches the observed data. Comparative Fit Index (CFI) and the root mean square error of approximation (RMSEA) were used to determine overall model fit, and Akaike information criteria (AIC) and Bayesian information criteria (BIC) were used to determine relative model fit, which are most useful for comparing two or more different models. Guidelines for interpreting fit indices vary, but a CFI of .95 or greater indicates good fit, and RMSEA of .05 or lower indicates low error (Brown & Moore, 2012). For AIC and BIC, lower scores indicate better relative fit. Additional analyses were conducted to determine the optimal length of the VT-ORG scales. This confirmatory factor analysis was conducted on the organization with the largest sample size—1,287. Items with low α or low factor loading were considered for deletion. A second CFA was conducted on the remainder of the dataset, comparing the original full VT-ORG to a model with items removed.

Concurrent validity was tested using structural equation modeling (SEM). This method can model the relationship between each of the VT-ORG subscale scores and the scores of the validating measures (Tabachnick & Fidell, 2012), that is, do the VT-ORG items measuring *Staff Health and Wellness* correlate strongly with the scale measuring *Compassion Satisfaction* from the validating ProQOL measure, as was hypothesized. This is a preferred method to multiple regression when doing multiple analyses, as it prevents an inflation of the α level (Tabachnick & Fidell, 2012). The proposed model can be seen in Fig. 1 and was theoretically and empirically derived and represents the expected relationships between the latent variables identified by the factor analysis and the validating items. SEM produces similar indices of model fit to confirmatory factor analysis, as well as path coefficients which express the effect size of relationships between the modeled variables.

Results

Response Rates and Missing Data Analysis

Employee participation in the survey ranged from 83% to 13%. The mean response rate was 46% ($SD = 24$). Smaller organizations tended to have greater response rates than larger organizations, although this tendency

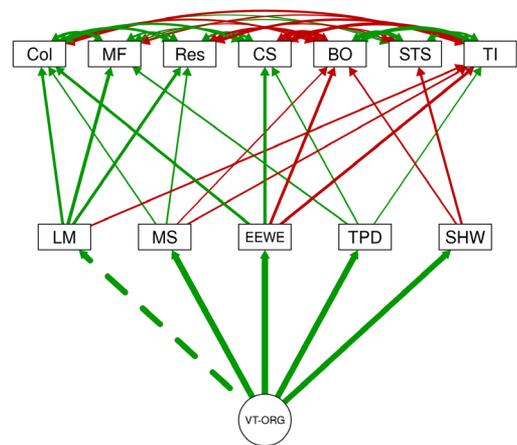


Fig. 1 The structural equation model. VT-ORG subscales: LM, Leadership and Mission; MS, Management and Supervision; EWE, Employee Empowerment and Work Environment; TPD, Training and Professional Development; SHW, Staff Health and Wellness. Organizational Efficacy Scale subscales: Col, Collaboration; MF, Mission and Future; Res, Organizational Resilience. ProQOL subscales: CS, Compassion Satisfaction; BO, Burnout; STS, Secondary Traumatic Stress; TI, Turnover Intention Scale. Single-sided arrows indicate directionality/regressions, and double-sided arrows indicate correlations. Red lines indicate negative relationships, and green lines indicate positive. Width of the line indicates strength (effect size) of the relationship.

was not statistically significant. Of the 3,018 total recorded responses, 1,117 (37%) had some missing data. Chi-square analyses showed that there were no significant differences between disciplines for total missing data or missing VT-ORG data, but EMS and VS agencies were significantly more likely to have missing validating items, $\chi^2(2) = 14.36$, $p < .01$. A logistic regression determined that missingness was related to years of experience, with less experienced participants more likely to have missing data. However, the effect size was extremely small, indicating that this relationship was functionally negligible ($\beta = -.02$, $p < .05$, Cox and Snell $R^2 < .01$).

Missing values were imputed for internal consistency and confirmatory factor analyses. Two-way imputation was chosen based on research demonstrating it produced the least discrepancy between actual and calculated α , regardless of the randomness of the missing data (van Ginkel, van der Ark, & Sijtsma, 2007). Imputation was completed using the TestDataImputation package in R (Dai, Wang, & Svetina, 2016).

Reliability and Confirmatory Factor Analysis

Table 2 presents the summary statistics for the VT-ORG subscales and validating measures, organized by discipline. Although one-way ANOVAs indicated there were

Table 2 Scale summary statistics by discipline

Measure	Emergency medical services	Law enforcement	Victim services
VT-ORG subscales			
Leadership and Mission	3.19 (0.86) 3	3.62 (0.81) 3.7	4.13 (0.72) 4.3
Management and Supervision	2.8 (0.78) 2.76	3.37 (0.8) 3.37	3.68 (0.79) 3.76
Employee Empowerment and Work Environment	2.72 (0.72) 2.75	3.22 (0.81) 3.18	3.86 (0.71) 3.9
Training and Professional Development	3.05 (0.76) 2.88	3.42 (0.8) 3.38	3.91 (0.71) 4
Staff Health and Wellness	2.38 (0.65) 2.2	3.36 (0.88) 3.36	3.71 (0.78) 3.75
ProQOL subscales			
Compassion Satisfaction	4.18 (0.48) 4.2	3.82 (0.69) 3.9	4.16 (0.54) 4.2
Burnout	2.42 (0.71) 2.4	2.28 (0.63) 2.2	2.2 (0.68) 2.1
Secondary Traumatic Stress	2.24 (0.61) 2.25	2.22 (0.57) 2.11	2.42 (0.64) 2.31
OES subscales			
Organizational Resilience	3.91 (1.52) 4.67	4.96 (1.1) 5.25	5.52 (0.8) 5.75
Mission and Future	3.42 (1) 3.25	3.56 (0.67) 3.5	4.19 (0.54) 4.25
Collaboration	3.36 (0.88) 3.67	4.26 (0.93) 4.33	4.98 (0.75) 5.11
Turnover Intention Scale	2.67 (0.48) 2.5	2.69 (0.97) 2.67	2.41 (0.88) 2.5

Note: Imputed values. Mean (*SD*) median.

significant ($p < .05$) differences between disciplines on all variables except for Turnover Intention ($p = .12$) and Burnout ($p = .53$), η^2 effect sizes were all $< .1$, indicating that there was overall consistency between the disciplines in each variable. Cronbach's α was calculated as a measure of internal consistency, or the extent to which items within a measure or subscale tended to agree with each other, using the Psych package in R (Revelle, 2017).

The first confirmatory factor analysis was conducted using data from the organization with the largest sample size ($n = 1,242$). The proposed model (Model 1) included the items loading into their respective subscales as organized on the instrument, with each subscale further loading into an overall VT-ORG construct which indicates an organization's progress toward becoming vicarious trauma-informed. Two models were tested with the data from the rest of the organizations ($n = 1,776$). Model 2 included all VT-ORG items, and Model 3 excluded variables that decreased the subscale α level or had a factor loading below .5 (6 total items were dropped). Confirmatory factor analyses were completed using the lavaan package in R (Rosseel et al., 2017).

The overall α for the VT-ORG was .98, in the excellent range. For Model 1, confirmatory factor analysis using maximum-likelihood estimation converged after 95 iterations. The chi-square test to determine difference between the hypothesized model and the observed data was significant ($p < .01$) but this was likely a function of the large sample size. Root mean square error of approximation (RMSEA) was .08 and Comparative Fit Index (CFI) was .752, indicating that the model fit was fair to marginal based on Brown and Moore's criteria, but within the cutoff for acceptable fit. For the dataset with the remaining organizations, Model 2 converged after 68 iterations. Root mean square error of approximation was .07

and Comparative Fit Index was .82, indicating that the model fit was fair, although improved from the Model 1. Model 3 converged after 65 iterations. RMSEA was .07 and Comparative Fit Index was .84, again indicating that the model fit was fair. The comparative fit indices show that Model 3 provided a modest improvement in model fit (Model 2 AIC: 283,501, BIC: 284,296; Model 3 AIC: 256,343, BIC: 257,073). A chi-square test found that that this improvement was significant, $\chi^2(1,947) = 2,946.7$, $p < .01$. Table 3 presents the results of the α and confirmatory factor analyses by subscale. The α levels for each subscale were in the good to excellent range. The standardized factor loadings of the subscales into an overall VT-ORG factor were notably consistent across the three models, with high (greater than .9) factor loadings for each subscale.

Structural Equation Modeling Results

Composite variables in the model were calculated through item means in cases where at least 80% of the responses were completed for the subscale, the recommended minimum for unbiased estimates (Little & Rubin, 2002). Composite variables for the validating measures were calculated according to the instrument instructions. The model is presented in Fig. 1. The original, nonimputed dataset was used, and 1,132 participants were excluded due to missing data. The model converged after 67 iterations using maximum-likelihood estimation. The comparative fit index was .99 and the root mean square error of approximation was .062, indicating a good fit of the data. The path coefficients, representing the relationships between the VT-ORG subscales and the validating measures, as well as the covariances are presented in Table 4. This information is also presented graphically in Fig. 1,

Table 3 Subscale statistics—reliability and confirmatory factor analyses

Subscale	Subscale α	Model 1 factor loading	Model 2 factor loading	Model 3 factor loading
Leadership and Mission	0.93	0.93	0.92	0.92
Management and Supervision	0.96	0.98	0.98	0.98
Employee Empowerment and Work Environment	0.95	0.96	0.96	0.96
Training and Professional Development	0.88	0.92	0.94	0.93
Staff Health and Wellness	0.93	0.97	0.96	0.96

where the color of the line represents the valence of the relationship and the width represents the strength.

Nearly all proposed relationships were significant at the $p < .01$ level. The strongest relationships in the model were the correlations between the subscales of the validating measures, unsurprising considering the closely related constructs. Relationships between the VT-ORG subscales and validating measures were still significant in the presence of these correlations, so these values represent the unique variance explained by these relationships. There was one unexpected relationship: Training and Professional Development showed a small but positive relationship with Turnover Intention (0.1), indicating that more opportunities for training and greater possibilities for professional advancement made turnover more likely. Leadership and Mission and Employee Empowerment and Work Environment showed the strongest relationships with validating measures. Staff Health and Wellness was the only subscale that negatively predicted Secondary Traumatic Stress. Overall, each subscale showed a significant relationship with a validating measure in the expected direction, indicating that each subscale of the VT-ORG has convergent validity with an existing measure of organizational or individual wellness.

Discussion

Overall, the results of the data analyses showed evidence that the VT-ORG is a reliable and valid measure of the readiness of an organization to address vicarious trauma. The VT-ORG represents a new perspective on managing stress and trauma exposure in these organizations by focusing attention away from individual strategies and self-care, which places additional burdens on the person

impacted by the trauma exposure, and refocusing the work on the organization's responsibility to care for its staff. While there have been previous efforts to create similar assessments, the VT-ORG is the first such assessment to be developed in tandem with a toolkit that can provide evidence-informed resources to address the needs identified by the assessment. When used in conjunction with the Vicarious Trauma Toolkit, the VT-ORG can provide a substantial benefit to organizations looking to strengthen their workplace health.

The VT-ORG was administered to a large and diverse sample of first responders and victim assistance providers from several organizations across the country. The results of the reliability analyses indicated a high level of internal consistency, which demonstrated that the items within each subscale generally agree with one another and are measuring a unitary factor. The results of the confirmatory factor analysis indicate that the proposed 5-factor structure of the VT-ORG matches the data well using both data from the largest organization and the remaining data set. The fair-to-marginal model fit as identified by the CFI may be an underestimate due in part to the complexity of the models. Both simulated and actual studies have shown that increasing numbers of variables in models leads to artificially low fit indices (Kenny & McCoach, 2003), so the length of the VT-ORG may be contributing to biased fit indices. RMSEA, which is more robust to increasing numbers of variables, showed that the model fit for each CFA was acceptable.

The α and confirmatory factor analyses did suggest some potential items for deletion. Five items had a factor loading lower than .5, and one item decreased the subscale α level. The comparison between models with these items retained versus these items dropped demonstrated modest improvements in overall model fit. However, these were problematic items for deletion in many cases—some set up later questions with higher factor loadings and others have strong content validity given the large body of evidence supporting the connection between the topic and vicarious trauma. Given the modest change in the overall model fit gained by eliminating items, combined with this contextual information, it is recommended that users retain all original items in the final VT-ORG.

Interestingly, even items addressing potentially unpopular policies, such as no-tolerance policies for sexual harassment or the need to cover for absent employees, and programs with a mixed evidence basis, such as CISM, showed strong factor loadings with their associated subscales, suggesting that respondents evaluated these similarly to other associated programs. It is possible that availability of programs, distinct from whether there is evidence of their effectiveness, sends a message to employees about the organization's commitment to

Table 4 Structural equation model coefficients

	Coefficient						
Latent variables							
VT-ORG → Leadership and Mission	1.00**						
VT-ORG → Management and Supervision	1.04**						
VT-ORG → Employee Empowerment and Work Environment	1.07**						
VT-ORG → Training and Professional Development	0.99**						
VT-ORG → Staff Health and Wellness	1.05**						
Regressions							
Leadership and Mission → Collaboration	0.36**						
Leadership and Mission → Mission and Future	0.35**						
Leadership and Mission → Org. Resilience	0.49**						
Leadership and Mission → Turnover Intention	−0.21**						
Management and Supervision → Collaboration	0.13**						
Management and Supervision → Org. Resilience	0.19**						
Management and Supervision → Burnout	−0.07**						
Management and Supervision → Turnover Intention	−0.19**						
Employee Empowerment and Work Environment → Collaboration	0.39**						
Employee Empowerment and Work Environment → Compassion Satisfaction	0.34**						
Employee Empowerment and Work Environment → Burnout	−0.27*						
Employee Empowerment and Work Environment → Turnover Intention	−0.43**						
Training and Professional Development → Mission and Future	0.12**						
Training and Professional Development → Compassion Satisfaction	0.09**						
Training and Professional Development → Turnover Intention	0.09*						
Staff Health and Wellness → Burnout	−0.10						
Staff Health and Wellness → Secondary Traumatic Stress	−0.16						
Variance covariance matrix							
	1	2	3	4	5	6	7
1. Collaboration		−0.31**	0.31**	−0.18**	0.26**	0.04	−0.40**
2. Mission and Future	0.11**		0.15**	−0.06**	0.11**	0.06**	−0.09**
3. Organizational Resilience	0.19**	0.08**		−0.23**	0.21**	−0.08**	−0.27**
4. Burnout	−0.06**	−0.02**	−0.12**		−0.63**	0.52**	0.53**
5. Compassion Satisfaction	0.10**	0.04**	0.12**	−0.20**		−0.07**	−0.40**
6. Secondary Traumatic Stress	0.01	0.02**	−0.04**	0.15**	−0.02**		0.23**
7. Turnover Intention	−0.18**	−0.04**	−0.20**	0.22**	−0.18**	0.10**	

Note: Values above the diagonal are standardized coefficients, and values below are unstandardized.

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

employee's wellness. We urge users of the VT-ORG to consider the evidence base of any program they are considering when making organizational changes. This distinction reinforces that this assessment, like any assessment, should not be considered as absolute fact but instead be considered as one source of data. Changes in policies and practices should be considered in light of this assessment in combination with an examination of relevant literature on the evidence base of interventions and organizations' own estimations of their needs.

The results of the structural equation model established the convergent validity of the VT-ORG by demonstrating the correlation between these practices and measures of individual effects of VT. These included burnout and secondary traumatic stress among individuals, as well as organizational effects, such as the ability to effectively collaborate and organizational resilience. The importance of these results is twofold: They validate the VT-ORG as

a measure of the organizational response to VT, and they validate the need to address VT to protect both individual and organizational health.

Each of the subscales of the VT-ORG corresponded to at least one of the validating measures. Leadership and Mission correlated with each of the validating measures of organizational functioning, further reinforcing the importance of mission values alignment and skilled and thoughtful leadership in all aspects of an organization's functioning, a relationship that has been well documented (Calo, 2011; Chapin, Brannen, Singer, & Walker, 2008). Employee empowerment and work environment also had many and strong relationships with validating measures, underscoring the importance of both formal and informal approaches to addressing VT. Previous research has shown the importance of these informal practices on mitigating the effects of VT (Townsend & Campbell, 2009).

As expected, Staff Health and Wellness had relationships with individual measures of the impact of VT, negatively predicting burnout and secondary traumatic stress as measured by the validation instruments. This demonstrates that this subscale effectively assessed policies and programs that support health and wellness among employees. Training and Professional Development is the shortest subscale and had the lowest α level, but nevertheless it showed a positive relationship with compassion satisfaction and mission and future. The positive relationship found between Training and Professional Development and turnover intention was an unexpected result; however, Becker's human capital theory (1994) suggests that while training a workforce can actually increase turnover intention when the highly trained employee becomes more marketable and valuable to other firms, in effect outgrowing their organization or position.

Implications

The results indicate support for the reliability and validity of the VT-ORG. The evidence supports its use by organizational change agents within first responder or victim assistance agencies as a needs assessment. Organizational change can be tumultuous, particularly in first responder agencies (Willis, Mastrofski, & Weisburd, 2007), and efforts to make changes can fail to get off the ground due to a lack of buy-in from administration or staff. Importantly, the validated relationships between the VT-ORG and organizational and individual factors can be a valuable motivating tool in encouraging change among the organization and leadership.

The results of this study indicate that organizations can use the VT-ORG to justify improving their response to VT by highlighting the areas where they scored low as those that need improvement. For example, an organization that scores low on "Management and Supervision" will see that the organization is at risk for decreased collaboration and organizational resilience, as well as higher burnout and a greater likelihood of employee turnover. This makes the VT-ORG an especially useful tool for motivating organizations to allocate resources and time to address VT. Repeating the assessment over time may also provide a measure of whether or not there has been improvement in areas where the baseline assessment showed gaps, though additional research is needed to determine whether it has test–retest reliability.

The VT-ORG and its scoring recommendations are available free of charge on the Vicarious Trauma Toolkit (VTT, <https://vtt.ovc.ojp.gov>). They have been designed to be easy to use and accessible to individuals from a variety of professions. The organizations within this study ranged from 36 to 5,000 employees, showing its

scalability. In addition, the resources available in the VTT provide or suggest a range of solutions, from low (or no) cost suggestions or solutions to large-scale programmatic or policy changes meant to adjust the overall functioning of the organization. This makes these tools highly adaptable to a wide range of environments and circumstances present in first responder and victim assistance agencies.

Limitations

Despite the large sample size, the theory-based construction of the VT-ORG, and rigorous analyses, results should be considered in light of limitations. This is a cross-sectional survey research design. Limitations of this design include the use of self-reported measures that are vulnerable to bias on the part of the participants, including recall bias, social desirability, and self-censorship (Podsakoff & Organ, 1986). Cross-sectional data cannot be used to draw conclusions about causative relationships between the variables measured. Furthermore, this study was unable to examine potential confounds, such as mass casualty events or leadership changes, which could have a substantial effect on the organizational response to vicarious trauma. Given the preliminary nature of this study and the substantial gap in the literature that this study fills, these limitations are acceptable.

One challenge of assessing organizational level variables is the nested data structure. Nested data violate the assumption of independence of observations which is required for confirmatory factor analysis and structural equation modeling. For the purposes of calculating sample size, individuals cannot be considered independent observers, requiring a sample of at least 50 organizations (Hox, Maas, & Brinkhuis, 2010). Given the smaller number of agencies participating in this study, ignoring clustering (disaggregating) decreases model fit (Pornprasertmanit, Lee, & Preacher, 2014). This study disaggregated the data, in effect neglecting differences between types of organizations, in order to look at the relationships between the VT-ORG and the validating measures using structural equation modeling, but this is contrary to the proposed use of the VT-ORG.

Recruitment for this study was notably uneven, with the preponderance of data coming from law enforcement agencies, while there was an inability to recruit fire departments. The VT-ORG was specifically designed for law enforcement, fire services, victim assistance, and emergency medical services, but the validity of the VT-ORG for fire services was unable to be established. However, to the extent that aspects of the work of firefighters and the nature of fire departments are comparable to police, these findings could be applied to fire departments. The sample included one EMS agency, which does indicate a degree of

validity for this discipline, but the generalizability of these results was limited by its small sample size.

The substantial missing data from the final dataset constitute an area of concern. Imputation methods were used where appropriate. The analyses failed to reveal any concerning patterns to the missing data, and the remaining sample size was sufficient to run the desired analyses. However, the observed fair model fit of the CFAs despite the use of imputed data, which tends to inflate model fit, may suggest that proposed model may not be ideal and that another conceptual model that reorganizes the item pool another way may fit the data better.

Future Directions

Changes in VT-ORG scores could potentially be used to determine the effectiveness of new policies or practices to address vicarious trauma at an organizational level. Future studies could examine the value of the VT-ORG for repeated assessments, particularly when examining an organization that is undergoing an organizational change process to become more vicarious trauma-informed. Such a study could also potentially examine test–retest reliability.

Further, studies could more broadly sample organizations across diverse locations to make more general statements about the progress of first responder and victim assistance agencies at addressing vicarious trauma. Now that the psychometric properties of the VT-ORG have been established; overall scores could help inform policy or program development at a regional or national level. Differences between disciplines could also be helpful to examine to determine the impact of unique stressors or organizational factors on organizational efforts, or vice versa.

Conclusions

Within the sample, the Vicarious Trauma Organizational Readiness Guide showed excellent internal consistency. Confirmatory factor analysis indicates that the current factor structure of five organizational strategies—Leadership and Mission, Management and Supervision, Employee Empowerment and Work Environment, Training and Professional Development, and Staff Health and Wellness—fit the observed data. Although some items could potentially be dropped from the VT-ORG, removing these items did not substantially improve the model fit, and there is more value in retaining these important items.

The results of this study show that the VT-ORG subscales had significant relationships with known instruments that measure individual and organizational measures of the impacts of vicarious trauma. These relationships establish the concurrent validity of the VT-ORG. This, in addition

to the theoretically derived content validity of the items, establishes the VT-ORG as a valid measure of the organizational response to vicarious trauma. The VT-ORG is a reliable and valid assessment of victim service and first responder agencies' progress toward becoming vicarious trauma-informed. Organizations will benefit from the use of the VT-ORG to identify strengths and gaps and to guide their efforts at improving their ability to proactively address the impacts of vicarious trauma on the health and well-being of both their workers and their organizations.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical Approval

The authors of this manuscript have complied with APA ethical principles in their treatment of individuals participating in the research, program, or policy as described in the manuscript. The research has been approved by the Institutional Review Board at Northeastern University (IRB approval number 17-01-01).

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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