



## MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

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**Abstract:** *The present study employed a quantitative non-experimental design to examine the relationships between moral injury (MI), perceived supervisor leadership style, and risk of suicidal thoughts and behaviors (STB) in a purposive sample of full-time paramedics who provided patient care as a primary responsibility of their employment with emergency response organizations in Texas. Participants rated their perceptions of MI, the leadership behaviors of their current supervisor, and statements related to past and present STB. The findings revealed small-to-medium positive relationships between STB risk and MI dimensions, passive avoidant leadership dimensions, and active management by exception. There were small negative relationships between transformational leadership dimensions, provision of contingent rewards, age, and length of service. There was no significant difference in STB risk between males and females or perceptions of leadership style between paramedics with a history of STB and those without. Paramedics with a history of STB reported higher MI scores than those without. A stepwise multiple regression with cross-validation provided a predictive model with MI and Idealized Behaviors emerging as significant predictors of STB risk. The present study validated the construct of paramedic MI, provided empirical support for a relationship between leadership and paramedic follower well-being, and established a model for predicting paramedic STB risk based on MI and perceived supervisor leadership.*

**Keywords:** *moral injury, paramedic, suicide, transformational leadership, EMS, first responder*

### INTRODUCTION

The effect of occupational stress on employees has garnered significant attention across diverse research domains. Within the paramedic population, a growing body of literature has highlighted the increased risk of stress-related mental health outcomes, inclusive of suicidal thoughts and behaviors (STB) (Carleton et al., 2018; Davis et al., 2019; Jones et al., 2018; Milner et al., 2017; Vigil et al., 2019). While the prevailing body of literature regarding first responder mental health outcomes has substantially focused on

critical incidents and traumatic events, other research suggests that routine occupational stress is more strongly associated with burnout and psychological afflictions than major traumatic events (Larsson et al., 2016). While the nature of paramedic work results in exposure to critically ill and injured individuals and bearing witness to the death and dying process (Kleim & Westphal, 2011), paramedics also confront a multitude of occupational stressors beyond traumatic stress (Clompus & Albarran, 2016).

Despite a growing interest in the subject,

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# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

the factors influencing paramedic STB remain underexplored. Moral Injury (MI), conceptualized as the psychological distress emanating from “perpetrating, failing to prevent, or learning about acts that deeply contravene moral beliefs and expectations” (Litz et al., 2009, p. 700), presents a potential partial explanation of this increased risk of STB in this population. Though the construct of MI has been predominantly investigated within military populations (Litz & Kerig, 2019), its origin as a theoretical construct to elucidate unique moral aspects of combat trauma, which are inadequately captured by the diagnostic criteria for Post-Traumatic Stress Disorder (PTSD) (Drescher et al., 2011), and its substantial correlation with an elevated risk of suicidal behaviors (Ames et al., 2019; C. J. Bryan et al., 2018; Zerach & Levi-Belz, 2019), may offer vital insights.

The leadership literature has encountered criticism for favoring performance-oriented outcomes over employee well-being as a research endpoint (Inceoglu et al., 2018). While extant evidence substantiates an association between leadership behaviors and physical and psychological well-being (Ahmed et al., 2019; Gurt et al., 2011), it represents a limited segment of the leadership literature. Pertinent research exploring the relationship between leadership style and follower mental health within the paramedic context remains strikingly sparse despite the heightened risk of detrimental mental health outcomes in this population (Carleton et al., 2018; Davis et al., 2019; Jones et al., 2018; Milner et al., 2017; Vigil et al., 2019). Additionally, while theoretically proposed (Murray, 2019), the construct of MI has yet to be validated within the paramedic context. The present study explored the relationship between MI, perceived paramedic supervisor leadership style, and the prevalence of STB among career paramedics employed by emergency response organizations in Texas.

## METHODS

The present study utilized a survey-based, non-experimental quantitative study design approved by the Dallas Baptist University Committee for the Protection of Human Participants. The population of interest was career paramedics employed by emergency response agencies in Texas. The present study defined career paramedics as individuals holding certification or licensure as a paramedic through the Texas Department of State Health Services (TDSHS), whose full-time job duties involve primarily patient care. This specification was necessary as not all paramedics are employed full-time in a paramedic function and may have fundamentally different experiences related to their full-time occupation (Stanley et al., 2015).

Additionally, participation was restricted to those paramedics who work primarily under a single supervisor. While the role of time in leader-follower outcomes is not well understood, Shamir (2011) suggested that increased hierarchical distance between leaders and followers delays the effect of leadership behaviors. Rather than qualify participants based on an arbitrary relationship length, the present study focuses on the leadership behaviors of the paramedics' immediate supervisors. Due to the specific characteristics of the population being investigated, purposeful sampling through selection criteria was utilized to ensure that participants had characteristics similar to those of the population (McMillan, 2016).

The researcher solicited participants through grassroots and social media recruitment. The researcher sent an e-mail invitation to physician members of the National Association of EMS Physicians (NAEMSP) Texas Chapter and administrators for each of the 22 Texas Regional Advisory Councils (RACs). NAEMSP Texas Chapter members represent the physician medical

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

directors for EMS organizations across Texas. RACs are administrative bodies responsible for trauma system oversight in Texas, whose administrators have extensive professional network contacts. NAEMSP and RACs have traditionally supported research initiatives that advance paramedic well-being. The e-mail invitation described the purpose and scope of the present study and a request to distribute the survey instrument to paramedics within their professional network. The invitation also contained a link to the SurveyMonkey™ instrument. Additionally, the researcher posted an invitation on social media forums for Texas EMS providers on Facebook and LinkedIn. Participants were also asked to voluntarily refer other potential participants by providing e-mail contact information. Participants were allowed to enter into a drawing for \$25 prepaid gift cards. Data were collected between November and December 2020.

## *Instrumentation*

The present study utilized three existing instruments. The MIES (Nash et al., 2013) was used to assess MI. Supervisor leadership style was assessed using the MLQ-5X (Avolio & Bass, 2004). STB was assessed using the SBQ-R (Osman et al., 2001). Additionally, the researcher included four demographic questions about age, gender, length of paramedic certification or licensure, and length of time assigned to the current supervisor.

### Moral Injury Events Scale

In the full version of the MIES, respondents rate a series of nine statements using a six-point Likert scale, ranging from “Strongly Disagree” to “Strongly Agree.” Sample items include statements such as “I saw things that were morally wrong” and “I feel betrayed by leaders who I once trusted.” Responses produce a summative score between 9 and 54, with higher scores positively correlated with

measures of depression ( $r = 0.40$ ), anxiety ( $r = 0.28$ ), negative affect ( $r = 0.29$ ), and PTSD, and negatively correlated with measures of social support ( $r = -0.29$ ) and positive affect ( $r = -0.15$ ) (Nash et al., 2013). Richardson et al. (2020) found internal consistency for a two-factor model with subscales of Transgressions–Self (TS) ( $\alpha = 0.93$ ) and Transgressions–Other (TO) ( $\alpha = 0.86$ ) among military veterans. The TS subscale measures perceptions of distress from moral transgressions committed by the respondent. The TO subscale measures perceptions of distress from moral transgressions others commit. The present study utilized a reduced six-question version of the MIES, in which the TS subscale comprises MIES questions four and six ( $\alpha = 0.84$ ), and the TO subscale comprises MIES questions two, seven, eight, and nine ( $\alpha = 0.83$ ) (Richardson et al., 2020).

### Multifactor Leadership Questionnaire

The MLQ-5X measured supervisor leadership styles utilizing 36 items related to the leadership subscales. Respondents were asked to identify the frequency of certain leadership behaviors and outcomes on a five-point Likert-type scale ranging from “not at all” to “frequently, if not always” (Avolio & Bass, 2004, pp. 116–117). Instrument questions assessed leadership characteristics across a range of transformational, transactional, and passive avoidant styles, grouped into subscales of Idealized Attributes (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), Individual Consideration (IC), Contingent Reward (CR), Management by Exception – Active (MBEA), Management by Exception – Passive (MBEP), and Laissez-Faire (LF), with each subscale containing four items (Avolio & Bass, 2004). The subscale styles are further described in Table 1. The subscales were scored by averaging the responses for each subscale (Avolio & Bass, 2004). The MLQ-5X does not utilize composite scores.

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

When subordinates evaluated leaders, internal reliability was estimated at  $\alpha = .70$  for IA,  $\alpha = .70$  for IB,  $\alpha = .83$  for IM,  $\alpha = .75$  for IS,  $\alpha = .80$  for IC,  $\alpha = .73$  for CR,  $\alpha = .74$  for MBEA,  $\alpha = .70$  for MBEP, and  $\alpha = .74$  for LF (Avolio & Bass, 2004). Concerning external validity, a meta-analysis by Lowe et al. (1996) found high correlations between transformational leadership scales and measures of

leader effectiveness ( $r = 0.60$  to  $0.71$ ). Another meta-analysis of MLQ-5X literature confirmed a weaker but still significant relationship between transactional leadership measures ( $r = 0.08$  to  $0.56$ ) and effectiveness (Dumdum et al., 2002). Passive avoidant leadership measures correlated negatively with measures of effectiveness ( $r = -0.38$  to  $-0.37$ ) (Dumdum et al., 2002).

**Table 1**

*Characteristics of MLQ-5X Subscale Styles*

Style	Description
IA/IB	Leader serves as a role model, demonstrating consistency and high standards of moral conduct, putting followers' needs first, and sharing risk of failure (Avolio & Bass, 2004)
IM	Leader is able to inspire and motivate followers by giving meaningful context to the follower's work (Avolio, 2010; Bass, 1985)
IS	Leader stimulates followers to draw on innovation and creativity to solve problems and challenge the status quo (Avolio, 2010)
IC	Leader addresses individual followers' needs (Avolio, 2010); focuses on the development of followers (Bass, 1985)
CR	Leader provides rewards or incentives for the satisfactory completion of job tasks (Avolio, 2010)
MBEA	Leader provides some corrective action in response to failing to meet an expectation (Avolio, 2010)
MBEP	Leader waits for deviations to occur before taking action rather than addressing issues as they come up (Avolio, 2010)
LF	Leader avoids or is absent from the leadership and management of followers' work and avoids taking on responsibility (Avolio, 2010; Heinitz et al., 2005)

### Suicidal Behaviors Questionnaire – Revised

STB was measured with the SBQ-R. The SBQ-R consists of four questions, each addressing one of four suicidal behavior dynamics: lifetime suicide ideation and attempt, frequency of suicidal ideation over 12 months, the threat of suicidal behavior, and self-reported likelihood of suicidal behavior (Osman et al., 2001). Responses describe the frequency and severity of STB, with a corresponding score for each statement response. The instrument produces a summative score between 3 and 18.

Osman et al. (2001) validated the instrument's ability to identify current suicide

risk in both clinical and non-clinical samples, with sensitivity between 0.83 and 0.93 and specificity between 0.95 and 0.96 for suicide risk determined by established clinical diagnostic tools. A cutoff score of seven or higher identifies individuals at risk for suicidal behaviors in non-clinical populations (Osman et al., 2001). Additionally, Osman et al. (2001) suggested using SBQ-R question 1 to organize participants into risk and no-risk groups for research purposes, with scores of 1 assigned to the no-risk group and above 1 assigned to the risk group. Rueda-Jaimes et al. (2017) also found that the SBQ-R positively correlated with suicide risk determined by specialty-

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

trained psychiatrists. Overall internal reliability for clinical and non-clinical populations was estimated at  $\alpha = .76$  to  $.88$  (Osman et al., 2001).

## RESULTS

Statistical analyses were performed using the IBM Statistical Package for the Social Sciences (SPSS) software version 27. At the

end of the data collection period, 323 participants had accessed the survey. During consent and pre-screening, one participant declined to provide consent, 74 did not meet the criteria for participation, and 13 abandoned the instrument. Of the 235 qualified respondents, 184 (78.3%) completed the instrument. The descriptive statistics for the sample are displayed in Table 2.

**Table 2**

*Descriptive Statistics of the Sample*

	Count or Mean	Possible Range	Cronbach $\alpha$
<i>N</i>	184		
Age	38.5 ( <i>SD</i> = 9.8)		
Sex	Male <i>n</i> = 117 (63.6%) Female <i>n</i> = 67 (36.4%)		
Length of Service as Paramedic	11.0 ( <i>SD</i> = 8.5)		
Time With Current Supervisor	3.4 ( <i>SD</i> = 3.7)		
MIES: TS	5.9 ( <i>SD</i> = 3.3)	2 - 12	.798
MIES: TO	15.1 ( <i>SD</i> = 5.2)	4 - 24	.779
MLQ-5X: IA	2.3 ( <i>SD</i> = 1.1)	0 - 4	.839
MLQ-5X: IB	2.1 ( <i>SD</i> = 1.1)	0 - 4	.839
MLQ-5X: IM	2.2 ( <i>SD</i> = 1.2)	0 - 4	.905
MLQ-5X: IS	2.0 ( <i>SD</i> = 1.1)	0 - 4	.870
MLQ-5X: IC	2.1 ( <i>SD</i> = 1.1)	0 - 4	.806
MLQ-5X: CR	2.2 ( <i>SD</i> = 1.1)	0 - 4	.850
MLQ-5X: MBEA	1.9 ( <i>SD</i> = .9)	0 - 4	.700
MLQ-5X: MBEP	1.5 ( <i>SD</i> = 1.1)	0 - 4	.836
MLQ-5X: LF	1.1 ( <i>SD</i> = 1.1)	0 - 4	.895
Lifetime STB History	<i>n</i> = 114 (62%)		
Suicidal Thoughts in Past Year	<i>n</i> = 77 (41.8%)		
Current Suicide Risk (SBQ-R $\geq 7$ )	<i>n</i> = 66 (35.9%)		
SBQ-R	6.0 ( <i>SD</i> = 3.3)	3 - 18	.818

The individual response items of the Moral Injury Events Scale (MIES) described the prevalence of MI in the sample. More than half of the participants agreed with statements

reporting distress from witnessing immoral acts (*n* = 130, 70.7%), feelings of betrayal by leaders (*n* = 127, 69.0%), betrayal by fellow EMTs and Paramedics (*n* = 104, 56.5%), and betrayal by others outside of EMS (*n* = 99,

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

53.8%). Seventy-nine (42.9%) participants agreed with statements about distress from acting against their morals. Sixty-eight participants (37%) agreed with statements

about moral distress from failing to do something they should have done. The summary table for individual response MIES response items is displayed in Table 3.

**Table 3**

*MIES Summary Data*

	MIES2	MIES4	MIES6	MIES7	MIES8	MIES9
Mean	3.97	3.07	2.83	4.07	3.61	3.49
SD	1.56	1.83	1.73	1.76	1.69	1.73
Strongly Disagree (1)	19 (10.33%)	55 (29.89%)	62 (33.7%)	28 (15.22%)	29 (15.76%)	33 (17.93%)
Moderately Disagree (2)	24 (13.04%)	34 (18.48%)	34 (18.48%)	14 (7.61%)	30 (16.3%)	32 (17.39%)
Slightly Disagree (3)	11 (5.98%)	16 (8.7%)	20 (10.87%)	15 (8.15%)	21 (11.41%)	20 (10.87%)
Slightly Agree (4)	48 (26.09%)	28 (15.22%)	26 (14.13%)	40 (21.74%)	37 (20.11%)	39 (21.2%)
Moderately Agree (5)	53 (28.8%)	25 (13.59%)	26 (14.13%)	34 (18.48%)	38 (20.65%)	30 (16.3%)
Strongly Agree (6)	29 (15.76%)	26 (14.13%)	16 (8.7%)	53 (28.8%)	29 (15.76%)	30 (16.3%)

*n* = 184

MIES2: “I am troubled by having witnessed others' immoral acts.”

MIES4: “I am troubled by having acted in ways that violated my own morals or values.”

MIES6: “I am troubled because I violated my morals by failing to do something I felt I should have done.”

MIES7: “I feel betrayed by leaders who I once trusted.”

MIES8: “I feel betrayed by fellow EMTs and Paramedics who I once trusted.”

MIES9: “I feel betrayed by others outside of EMS who I once trusted.”

Pearson-product moment coefficient calculations were performed to evaluate the relationships between variables. The TS and TO subscales of the MIES were compared with SBQ-R suicide risk, as shown in Table 4. There was a small positive relationship between TS subscale scores and SBQ-R

scores,  $r(182) = .291, p < .001$ . There was also a moderate positive relationship between TO subscale scores and SBQ-R scores,  $r(182) = .367, p < .001$ .

The nine subscales of the MLQ-5X were correlated with current suicide risk, as shown in Table 5. There was a small negative

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

relationship between SBQ-R scores and IA ( $r(182) = -.169, p < .05$ ), IB ( $r(182) = -.222, p < .01$ ), IM ( $r(182) = -.215, p < .01$ ), IS ( $r(182) = -.177, p < .05$ ), IC ( $r(182) = -.206, p < .01$ ), CR ( $r(182) = -.174, p < .05$ ). There was a small positive relationship between SBQ-R scores and MBEA ( $r(182) = .170, p < .05$ ), MBEP ( $r(182) = .192, p < .01$ ), and LF ( $r(182) = .145, p = .05$ ). There was a small negative relationship between SBQ-R scores

and both age ( $r(182) = -.171, p < .05$ ) and length of service ( $r(182) = -.145, p < .05$ ).

An independent-samples *t* test was used to compare sample means between males and females using SBQ-R scores as the dependent variable. There was no significant difference between males ( $M = 5.69, SD = 3.20, n = 117$ ) and females ( $M = 6.42, SD = 3.43, n = 67$ ),  $t(182) = -1.44, p = .151, d = .22$ .

**Table 4**

*MIES Correlations with Suicide Risk*

	SBQ-R	MIES: TS
SBQ-R	--	
MIES: TS	.291***	--
MIES: TO	.367***	.338***

\*\*\*. Correlation is significant at the 0.001 level (2-tailed).

**Table 5**

*MLQ-5X Correlations with Suicide Risk*

	IA	IB	IM	IS	IC	CR	MBEA	MBEP	LF	SBQ-R
IA	--									
IB	.801**	--								
IM	.847**	.836**	--							
IS	.788**	.758**	.809**	--						
IC	.847**	.770**	.803**	.850**	--					
CR	.836**	.845**	.846**	.812**	.833**	--				
MBEA	-.267**	-.169*	-.300**	-.243**	-.254**	-.175*	--			
MBEP	-.695**	-.647**	-.637**	-.613**	-.676**	-.701**	.153*	--		
LF	-.780**	-.722**	-.681**	-.697**	-.744**	-.762**	.128	.812**	--	
SBQ-R	-.169*	-.222**	-.215**	-.177*	-.206**	-.174*	.170*	.192**	.145*	--

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

\* . Correlation is significant at the 0.05 level (2-tailed).

Cases were grouped by recoding the original responses to SBQ-R question 1 as “no lifetime history” for a score of 1 and “lifetime history” for a score of 2 to 4. Independent-samples *t* tests were then used to compare mean MIES and MLQ-5X scores between SBQ-R groups.

Respondents with a lifetime history of STB ( $M = 6.57, SD = 3.19$ ) had significantly higher Transgressions-Self scores than those who had no lifetime history of STB ( $M = 4.79, SD = 3.07$ ),  $t(182) = -3.74, p < .001, d = .57$ . Respondents with a lifetime history of STB ( $M = 16.37, SD = 3.19$ ) had significantly higher

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

Transgressions-Other scores than those who had no history of STB ( $M = 13.16, SD = 5.17$ ),  $t(182) = -4.22, p < .001, d = .64$ . There was no significant difference in MLQ-5X subscale scores between those with a history of STB and those without.

A series of simple linear regression analyses were conducted with SBQ-R scores as the criterion variable and each of the MIES and MLQ-5X subscale scores as predictor variables. The results of the regression analyses are presented in Table 6. All of the subscales were independently significant predictors of current suicide risk, accounting for 2-13% of the variation in SBQ-R scores.

Stepwise multiple regression was used to evaluate the MIES and MLQ-5X subscales as

predictors of suicide risk, both with and without the influence of demographic variables. The first regression evaluated the MIES and MLQ-5X subscales using a probability level of .15 for entry into the model (Tabachnick & Fidell, 2019). A random sample of 145 cases was utilized to allow for later cross-validation. Overall, the regression was significant,  $F(3,141) = 11.87, p < .001, R^2 = .20$ . Of the predictors investigated, Transgressions-Other ( $\beta = .03, t(141) = 3.09, p = .002$ ), Transgressions-Self ( $\beta = .04, t(141) = 2.63, p = .010$ ), and IB ( $\beta = -.10, t(141) = -2.16, p = .033$ ) were significant. No other predictors were included in the final model. The first regression model is summarized in Table 7 and Table 8.

**Table 6**

*Simple Linear Regressions Predicting SBQ-R Scores*

Predictor	<i>R</i>	<i>R</i> <sup>2</sup>	$\beta$	<i>t</i> (182)
Transgressions-Self	.29	.09	.06	4.10***
Transgressions-Other	.37	.13	.04	5.32***
IA	.17	.03	-.10	-2.31*
IB	.22	.05	-.13	-3.07**
IM	.22	.05	-.12	-2.97**
IS	.18	.03	-.10	-2.42*
IC	.21	.04	-.12	-2.84**
CR	.17	.03	-.10	-2.38*
MBEA	.17	.03	.12	2.33*
MBEP	.19	.04	.11	2.64**
LF	.15	.02	.08	1.98*

\* Predictor is significant at the 0.05 level

\*\* Predictor is significant at the 0.01 level

\*\*\* Predictor is significant at the 0.001 level

Cross-validation of the stepwise multiple regression analysis was conducted to evaluate for overfitting of the regression model. The cross-validation results for the first model are summarized in Table 9. The predicted SBQ-R

values for the initial regression equation demonstrated a moderate correlation with reported values ( $r = .45, p < .01$ ). The Pearson *r* and *R*<sup>2</sup> values were reasonably proximate. However, the values reflect a better fit of the



# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

regression equation in the primary sample.

**Table 7**

*First Stepwise Multiple Regression Model ANOVA*

	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.003	3	4.001	11.871	< .001
Residual	47.521	141	0.337		
Total	59.524	144			

**Table 8**

*First Stepwise Multiple Regression Model Beta Coefficients*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	1.879	.203		9.255	<.001
TO	.032	.010	.258	3.091	.002
TS	.041	.016	.212	2.628	.010
IB	-.104	.048	-.168	-2.155	.033

**Table 9**

*Cross-Validation of First Stepwise Regression Analysis*

	n	R <sup>2</sup>	Pearson r
Primary Sample	145	.20	.449 ( <i>p</i> < .001)
Validation Sample	39	.15	.391 ( <i>p</i> = .014)

The second regression evaluated the MIES and MLQ-5X subscales after considering the impact of the demographic variables of age, gender, length of service, and time under the current supervisor. The demographic variables were entered in Step 1 of the regression, using stepwise selection for inclusion or exclusion from the model. The MIES and MLQ-5X variables were entered in Step 2 using stepwise selection. Overall, the regression was significant  $F(5,139) = 10.13, p < .001, R^2 = .27$ . Of the predictors investigated, age ( $\beta = -.02, t(139) = -3.55, p = .001$ ), Transgressions-

Other ( $\beta = .04, t(139) = 3.51, p = .001$ ), and MBEP ( $\beta = .10, t(139) = 2.35, p = .020$ ) were significant. Although included in the model, Transgressions-Self ( $\beta = .03, t(139) = 1.88, p = .062$ ) and MBEA ( $\beta = .09, t(139) = 1.73, p = .086$ ) were not significant predictors of current suicide risk. The second regression model is summarized in Table 10 and Table 11.

The cross-validation results for the second model are summarized in Table 12. Following the inclusion of the demographic variables in the first step of the regression, the predicted SBQ- R values did not significantly correlate

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

with the reported values, suggesting substantial overfitting of the model in the second analysis.

**Table 10**

*Second Stepwise Multiple Regression Model ANOVA*

	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.106	5	3.221	10.313	< .001
Residual	43.418	139	.312		
Total	59.524	144			

**Table 11**

*Second Stepwise Multiple Regression Model Beta Coefficients*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	1.879	.203		9.255	< .001
Age	-.018	.005	-.267	3.545	.001
TO	.035	.010	.282	3.507	.001
MBEP	.102	.043	.178	2.353	.020
TS	.029	.016	.150	1.880	.062
MBEA	.094	.054	.132	1.731	.086

**Table 12**

*Cross-Validation of Second Stepwise Regression Analysis*

	n	R <sup>2</sup>	Pearson r
Primary Sample	145	.27	.52 ( <i>p</i> < .001)
Validation Sample	39	.09	.30 ( <i>p</i> = .068)

## DISCUSSION

The data showed a small positive correlation between Transgressions-Self and SBQ-R scores and a medium positive correlation between Transgressions-Other and SBQ-R scores. These findings validate in the paramedic population the association between MI and the risk of STB found in military populations (Ames et al., 2019; C. J. Bryan et al., 2018; Zerach & Levi- Belz, 2019). The

strength of the relationships between suicide risk and the moral injury dimensions is contrasted by an earlier military study that found a stronger association between self-perpetrated transgressions and suicide risk than other-perpetrated transgressions and suicide risk (A. Bryan et al., 2014). These differences may be related to the types of self-perpetrated potentially morally injurious events (PMIEs) between the paramedic and

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

military populations. The unique types of PMIEs encountered by paramedics warrant additional investigation.

There were significant relationships between all of the MLQ-5X subscales and SBQ-R scores. Unsurprisingly, the transformational leadership dimensions of IA, IB, IM, IS, and IC were negatively associated with STB risk, though the associations were small. Similarly, passive avoidant leadership dimensions of MBEP and LF demonstrated small but significant, positive associations with STB risk. The effects for the transactional leadership dimensions were also small, with CR negatively associated with STB risk and MBEA positively associated with STB risk. The transformational leadership dimensions of IB, IM, and IC demonstrated the most substantial effect sizes among the leadership dimensions.

The small effect sizes for the associations between the dimensions of leadership measured in the present study and the risk of STB are likely due in part to the indirect effect of leadership behaviors on follower well-being established in other literature. Prior studies have contended that leadership style affects follower well-being through several mediating and moderating pathways (Ahmed et al., 2019; Gilbert & Kelloway, 2018; Hentrich et al., 2017; Holstad et al., 2014; Kara et al., 2013; Liu et al., 2010; Pinck & Sonnentag, 2018). A better understanding of these mediating and moderating factors may help clarify the role that leaders play in paramedic suicide risk.

## *Demographic-Based Differences*

There were small negative associations between age and length of service and SBQ-R scores, but no significant difference between SBQ-R scores for males and females. There are several possible explanations for the relationship between suicide risk and the characteristics of age and length of service. First, paramedics with more professional and

life experience may have developed more robust physical, psychological, and social resources that allow them to mitigate better the factors influencing suicide risk. Secondly, it is possible that paramedics with a higher risk of STB and other psychiatric co-morbidities do not remain in the profession.

## *Differences Based on Past STB*

Causal relationships cannot be inferred from correlation and regression analyses. Within the context of the present study, it cannot be concluded whether moral injury and supervisor leadership style cause increased suicide risk or if increased suicide risk influences the perception of moral injury and supervisor leadership style. Participants with a lifetime history of STB reported higher levels of Transgressions-Self and Transgressions-Other than those without a lifetime history. These differences contrast the findings of A. Bryan et al. (2014) who identified differences in MI only between individuals with an actual past suicide attempt and those without. Due to the cross-sectional nature of the present study, it is impossible to know whether the transgressive act or acts that produced the current MI preceded or followed the prior STB. Future research should consider longitudinal designs to evaluate the effect of MI and PMIEs over time.

In contrast to the MIES scores, there were no significant differences in the leadership subscale scores between the lifetime history of STB and no lifetime history groups. Taken together with the significant relationships identified between perceived supervisor leadership and current suicide risk, these findings suggest that suicide risk influences perceptions of supervisor leadership to a lesser degree than perceptions of supervisor leadership influence suicide risk.

## *Predictive Models*

Individually, each of the MIES and MLQ-5X

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

subscale scores was a significant predictor of current suicide risk. All effect sizes for the simple linear regression models were small, except for Transgressions-Other. Transgressions-Other demonstrated a medium effect size, accounting for 13% of the variance in SBQ-R scores when evaluated independently.

The stepwise method identified three significant predictors of suicide risk: Transgressions-Other, Transgressions-Self, and IB. The overall model accounted for 20% of the variance in SBQ-R scores. Cross-validation with an independent sub-sample demonstrated reasonable proximity between  $R^2$  scores for the primary and validation samples. While the second model was significant overall and accounted for 27% of the variance in SBQ-R scores, cross-validation analysis suggested severe overfitting of the model, precluding generalizability to a larger population. This analysis would likely yield different results in a more robust sample.

## *STB Prevalence*

The present study findings align with prior studies regarding suicide risk in paramedics and other first responders. Sixty-two percent of the sample reported a prior history of STB, higher than the 46.8% reported by Stanley et al. (2016). Sixty-six participants (35.9%) met or exceeded the SBQ-R cutoff score to be considered at increased risk for suicide, which is consistent with the findings presented by Jones et al. (2018) in their study of Arizona EMS workers and firefighters. One notable finding is that while an earlier study of Canadian first responders found that paramedics had a 15.4% prevalence of suicidal thoughts in the year preceding the study, nearly 42% of participants in the present study reported having suicidal thoughts within the past year. The reason for this disparity is unclear, though it is essential to consider that the present study was conducted amid the

global SARS-CoV-2 pandemic. SARS-CoV-2 has resulted in widespread psychological effects in many groups, including healthcare workers (Le et al., 2020). The long-term psychological effects of the SARS-CoV-2 pandemic on the paramedic population are yet to be discovered.

## *MI in the Paramedic Context*

In recent years, the construct of MI has been extended from its traditional origins in the military into other populations, such as law enforcement (Papazoglou et al., 2019), child protective service workers (Haight et al., 2017), and healthcare (Dean et al., 2019; Dzung & Wachter, 2019; Mehta & Mehta, 2019). The present study appears to be one of the first to empirically validate the MI construct in the paramedic population. The MIES response data suggest that paramedics in the present study identified with and experienced the dimensions of MI as measured by the MIES. In practice, the validation of MI in the paramedic population highlights the need to better understand and address MI alongside more commonly identified phenomena such as PTSD or burnout.

In contrast to military data (A. Bryan et al., 2014), the present study identified a stronger relationship between suicide risk and moral transgressions perpetrated by others than between self-perpetrated transgressions and suicide risk. While the dimensions of the MI construct appear to translate across vocational populations, the types of PMIEs encountered are likely to vary significantly. For example, it is unlikely that a paramedic will encounter a situation in which they will need to employ lethal force. In contrast, this occurrence is far more likely for a military service member during wartime. Further research is needed to identify and describe the specific types of MI and PMIEs that paramedics experience.

## *Leadership and Paramedic Well-Being*

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

Although the relationships between supervisor leadership style and paramedic suicide risk were small, the results were practically significant. The results of the present study add to earlier findings from other vocational contexts that linked leadership behaviors to well-being outcomes, such as physical and psychological health (Herr et al., 2019; Liang et al., 2018). The present study adds to the existing body of knowledge by extending empirical validation of leadership/follower well-being relationship theories into the paramedic context.

The MLQ-5X utilized in the present study evaluated leadership behaviors across the full-range model of leadership proposed by Avolio and Bass (2002). Generally, transformational leadership behaviors were negatively associated with STB risk, such that higher levels of transformational leadership were associated with lower STB risk. Conversely, passive avoidant leadership behaviors were associated with higher levels of suicide. Transactional leadership behaviors were not uniformly associated with STB risk, with CR behaviors associated with decreased STB risk and MBEA associated with increased STB risk. Regehr and Millar (2007) suggested that when the potential consequences of non-conformance are low, MBEA contributed to occupational stress. Evaluating the circumstances in which MBEA behaviors are employed may be helpful in further understanding this relationship.

The nature of the present study precludes the determination of causal relationships between leadership behaviors and paramedic STB risk. It is possible and perhaps likely that certain leadership behaviors, particularly the dimensions of transformational leadership, are beneficial to follower well-being. It is also possible that organizations in which transformational leadership is prevalent also possess other characteristics related to organizational culture that positively influence

follower well-being. Regardless of the mechanism, the results of the present study emphasize the importance of leadership development and the fostering of an organizational culture that enables effective leadership as part of a larger employee well-being strategy.

## *Understanding and Addressing STB Risk Factors*

The present study identified a model for predicting STB risk in paramedics, including IB in supervisors and paramedic MI. IB includes consistently demonstrating high standards of moral conduct and putting followers' needs first (Avolio & Bass, 2002). It is not surprising that this dimension of transformational leadership predicted some of the variance in STB risk. However, it is essential to consider that the subscale scores for the dimensions of transformational leadership were strongly inter-correlated ( $R = .756$  through  $.850$ ). Stepwise multiple regression selects and removes variables from the model based on predictive strength rather than underlying theory. Thus, it is prudent to interpret the regression analysis results from the perspective of IB being the most statistically significant predictor but not necessarily the most practically significant predictor.

Conservation of Resources (COR) theory suggests that humans attempt to maintain resources during times of stress and acquire resources to mitigate future stressors (Hobfoll, 1989). Hobfoll (1989) defined resources as "those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies" (p. 516). In the leader-follower relationship, leaders can provide and deprive the follower of resources, contributing to both the development and avoidance of harmful stress.

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

While IB may provide resources in the form of positive role modeling and social support, it is essential to consider that the nature and quality of the leader-follower relationship may contribute to stress outcomes, including STB risk, in a more complex system.

Cognitive-relational theory (Lazarus & Folkman, 1984) may also explain the role of leadership behaviors in predicting STB risk. Within cognitive-relational theory, an individual's stimulus appraisal determines its classification as a negative or positive stressor. In practical terms, two individuals may experience the same event. However, one may appraise the event as harmful and experience negative stress, while the other may appraise the event as benign. Transformational leadership behaviors may influence the stress appraisal process by providing meaning for actions and events (Bass, 1990). Inspirational Behaviors may accomplish this by clarifying leaders' values and affirming the shared values of the team (Kouzes & Posner, 2017).

MI is a novel construct in the paramedic context. The results of the present study validate the experience of MI among participants, indicating that nearly all participants experienced one or more of the MI dimensions measured by the MIES. Further, the ability of measures of MI to predict STB risk in paramedics highlights the need to understand the phenomenon in this population better. Exposure to PMIEs is unavoidable given the nature of paramedic work, but understanding that MI exists as a unique phenomenon from PTSD provides the opportunity to address MI more effectively. Clinical and spiritual interventions specifically targeting MI may help reduce MI and subsequent STB risk. However, the evaluation and efficacy of these interventions are beyond the scope of the present study.

## *Limitations*

There were some limitations to the present

study. First, the present study focused on career paramedics employed by emergency response organizations in Texas. Specifically, the population of interest was full-time paramedics who provided patient care as a primary function of their employment with an organization that responded to 9-1-1 calls. The geographical limitations of the sampling frame may limit the generalizability of findings to other geographic areas, as population and environmental characteristics are likely to vary between states and countries. Additionally, the narrow participation criteria for the sample may also restrict the generalizability of results to other subsets of the paramedic population, such as non-emergency medical transportation providers and those who work in healthcare facilities.

Second, the study design evaluated two general variables, MI and perceived supervisor leadership style, as predictors of STB risk. The present study does not assume or propose that MI and leadership style are the sole predictors of STB risk, which is also supported by the fact that Transgressions-Self, Transgressions-Other, and IB accounted for only 20% of the variance of STB risk in the sample. The literature suggests that MI and leadership style are likely a piece of a complex system of interacting factors related to suicide risk. Thus, the constructed predictive models should not be considered comprehensive.

Finally, the research design was cross-sectional. As a result, it is impossible to conclude the effect of MI and supervisor leadership style on STB risk over time. Additionally, the present study did not evaluate the temporal relationship between exposure to PMIEs and the development of moral injury.

## *Recommendations for Further Study*

The present study's findings, implications, and limitations inform recommendations for future research. First, the present study appears to be

# MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS

the first to empirically validate the construct of MI in a paramedic population. However, the quantitative nature of the present study yields little insight into the nature of MI and PMIEs paramedics experience. While the results of the present study suggest that the identification of MI in paramedics is an essential consideration for STB risk reduction, it is also necessary to better understand the types of PMIEs experienced by paramedics and develop detailed descriptions of the experience of MI in this population. Thus, there is a substantial need for qualitative research exploring MI in paramedics.

Second, the present study was delimited by using the MLQ-5X to measure perceived supervisor leadership. Future research should consider the relationships between STB risk and other dimensions of leadership not measured by the MLQ-5X, such as authentic leadership, servant leadership, and abusive leadership. Additionally, the literature supports an indirect relationship between leadership and follower well-being (Hentrich et al., 2019; Inceoglu et al., 2018; Rahimnia & Sharifirad, 2015). Beyond exploring additional leadership dimensions, future research should further explore the mediating and moderating factors affecting the relationships between leadership style and STB risk.

Finally, two aspects of the study design can be improved in future studies. The cross-sectional nature of the present study precludes determinations about the relationships of MI, supervisor leadership, and STB risk over time. Future studies would benefit from a longitudinal study design to evaluate the temporal stability of MI effects and past leadership behaviors on STB risk. Further, future studies may be improved with a larger sample size. Relaxing the participation criteria may enhance participation in future studies and broaden the population to whom findings may be generalized.

## CONCLUSION

The present study contributes to the body of knowledge by validating the construct of MI in the paramedic population, providing empirical support for a relationship between leadership and paramedic follower well-being, and establishing a model for predicting paramedic STB risk based on MI and perceived supervisor leadership. Given the increased risk of stress-related mental and physical illnesses in EMS workers, leadership practitioners, academicians, clinicians, and spiritual care providers must continue to enhance their understanding of the nature of this risk and its associated implications. As the results of the present study suggest, paramedic leaders play a role in this process by managing the environments in which occupational MI may occur and through leadership behaviors associated with STB risk.

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# **MORAL INJURY, LEADERSHIP, AND SUICIDE: A STUDY OF TEXAS PARAMEDICS**

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