

Towards Safer Spaces: An Empirical Investigation of Trainee Psychological Safety Within Academic Medical Centers

Laurence M Boitet ^{1,2}, Katherine A Meese ^{2,3}, Katherine L Sweeney ⁴, Norman R Estes ⁵, Megan M Hays ^{2,6}, Christine Loyd ⁵, David A Rogers ^{2,7}

¹Department of Medical Education, University of Alabama at Birmingham (UAB), Birmingham, AL, USA; ²UAB Medicine Office of Wellness, UAB, Birmingham, AL, USA; ³Department of Health Services Administration, UAB, Birmingham, AL, USA; ⁴Department of Sociology, UAB, Birmingham, AL, USA; ⁵Department of Clinical and Diagnostic Sciences, UAB, Birmingham, AL, USA; ⁶Department of Physical Medicine and Rehabilitation, UAB, Birmingham, AL, USA; ⁷Department of Surgery, UAB, Birmingham, AL, USA

Correspondence: Laurence M Boitet, Email Lmlac@uab.edu

Purpose: Psychological safety is critical for fostering well-being. Integral to the mission of academic institutions, trainees are among the most vulnerable to negative workplace experiences, calling for a need to understand factors that contribute to psychological safety in this population. Our objective is to empirically explore trainee psychological safety to inform best practices for training environments.

Design: A survey was used to capture organizational, interpersonal, and individual factors, as well as demographic information in graduate, postdoctoral, medical, resident, and fellow trainees. Descriptive statistics, multivariate ordinal logistic regression, and dominance analyses were used to understand psychological safety and the predictors that explained the majority of the variance in its statistical model.

Findings: Gender minorities and those who suppressed their race information were less likely to feel psychologically safe. Psychological safety was predominately explained by senses of belonging, recognition, and respect. Notably, trust and confidence in supervisor emerged as a pivotal factor influencing belonging and respect, whereas organizational support played a crucial role in fostering recognition and belonging. Intriguingly, clarity in role expectations and autonomy were positively correlated with recognition.

Originality: Our findings highlight the interplay between organizational, interpersonal, and individual dynamics shaping psychological safety. Importantly, those who suppress their race as well as female or gender minorities are disproportionately prone to feeling unsafe. We further elucidate role clarity and autonomy as important factors in achieving a sense of recognition. We suggest programs prioritize development beyond technical competencies, recognizing trainees as key stakeholders in the cultivation of positive culture within academic environments.

Keywords: psychological safety, trainee, belonging, recognition, respect, autonomy, role clarity

Introduction

A psychologically safe environment facilitates learning by encouraging questions, risk-taking, and extrapolating important lessons from mistakes.¹ This fosters the development of professional behavior, creativity, and work engagement,^{2,3} all vital in academic medical centers, where continuous learning drives problem solving, collaboration, and innovation in both research and clinical practice.⁴ Within this setting, learning is not a process that ceases after the completion of training, but is an essential component of all job roles even beyond the training years.⁵⁻⁷

Psychological safety is inherently a team-based construct,¹ and working in teams is central to problem-solving, clinical outcomes, research impact, and productivity.^{8,9} Described nearly in parallel to Tuckman's stages of group development,¹⁰ psychological safety proceeds through four stages:¹¹ inclusion safety, learner safety, contributor safety,

and challenger safety. As such, inclusion, or feeling a sense of belonging, is similar to the forming phase of group development wherein members work together to create structure and define goals, direction, and roles. Learner safety is congruent to storming, which demands respect as individuals work through challenges and conflict to learn how to best work together toward a common purpose. Contributor safety then echoes the norming phase, in which group members are cooperative, recognized, and able to express authentic ideas and feelings. Finally, challenger safety parallels the performing stage of group development, where high levels of work engagement are achieved, and challenging ideas are accepted.¹⁰

Psychological safety has both explicit and implicit dimensions.¹² While the explicit support of psychological safety is a conscious process, implicit behaviors exist, referred to as the hidden curriculum, that set the standard for norms, values, and behaviors within work culture.¹³ In fact, negative interpersonal experiences of hidden curriculum (eg, inappropriate conversation, denigration of patients, poor teaching style, and mistreatment of others) are shown to affect the professional development of trainees.¹⁴ Furthermore, exposure to leaders who give rhetorical reassurance then deviate from expected behavior can put trainees at risk of moral distress.¹⁵ Moral distress has been shown to augment burnout^{16,17} and therefore it is important to consider its impact on trainees. As such, lack of accountability, apathy, and work-life imbalance can negatively influence this hidden curriculum, while empathy and psychological safety can positively influence both training and workplace culture.¹⁸ Trainees exposed to negative behavior from their leaders are more likely to experience depersonalization, negative impacts on job performance, and go on to perpetuate a toxic workplace culture themselves.¹⁹ As such, unclear work expectations, insufficient autonomy, perceived lack of organizational support, and negative interactions with mentors and supervisors can also contribute to workplace stress,^{20–23} which are concepts that have yet to be understood in relation to trainee psychological safety.

A psychologically safe environment is essential for trainees, whose role is to learn how to interface with uncertainty, build confidence in taking calculated risks, and make mistakes, allowing for transformational learning.¹⁸ Training environments tend to be high stress, with studies demonstrating correlations between the environment, psychological distress, and attrition.^{24–26} While experiences, expectations, and curricula for trainees across disciplines differ, trainees in all areas must navigate their role within the organization, with issues with autonomy, workload, unpredictability, and burnout, among other factors.^{27–30} It remains unclear what behaviors facilitate psychological safety of this unique population, emphasizing the need to understand how to bolster a productive learning environment for these individuals.

Here, we argue that working to understand trainee psychological safety is essential not only to trainee professional development but to the perpetuation of a positive learning culture. In fact, the US Surgeon General included psychological safety as one of the essentials of the Framework for Workplace Mental Health and Well-Being.³¹ Psychological safety is key for innovation, organizational outcomes, and work culture.³² Due to its impact on individual development and behavior, ensuring both explicit and implicit safety is imperative for the presence of an engaged future workforce. Three antecedents of psychological safety in the context of healthcare were recently identified: (1) organizational or system factors, including policy, management style and organizational support; (2) interpersonal factors, including trust, respect, support, leader behavior, and communication; and (3) individual factors, including identity, status, and individual behavior.³² To our knowledge, these factors have yet to be explored within trainee populations.

This study addresses the significant gap in understanding trainee psychological safety by examining its multidimensional nature, in which individual, interpersonal, and organizational factors are interwoven. Our aim is to empirically examine these correlates to enhance the comprehension of trainee psychological safety in this distinctive context. The insights gained will inform the development of best practices and policies for supporting the well-being of trainees and subsequent preservation of the academic workforce.

Methods

Study Sample and Data Collection

An anonymous cross-sectional employee engagement survey was distributed by email from June 1–July 8, 2022 to 23,697 employees of a large academic medical center in the southeastern United States. Data were collected using the Medallia Experience Management Software Platform (Medallia Inc., Pleasanton, CA). Eligible participants were

employees of the surveying institution who worked within the academic medical center at the time of the survey and consented to being a part of the study. Within the survey platform, participants were informed about the voluntary nature of the survey and the minimal risks involved in its completion. Participants were required to consent to participate and if consent was not provided, they were automatically excluded and thus exited from the survey platform.

Within the survey, participants were asked to select their job role from a pre-determined list, with the option to write in their role if it was not included. Job roles included Faculty-Physician, Guest Services, Pastoral Care, and Respiratory Therapist, among other options. To capture the trainees within the academic medical center, trainee designations of Medical Student, Graduate Student, Post-doc, Resident, and Fellow were also listed. Of note, the physician scientist (MD/PhD) trainees were instructed to select their job role (eg, medical student or graduate student) based on the phase of their program that they were in at the time of survey. For this study, the employee engagement survey data were narrowed to only include the trainee designations to explore their experience with psychological safety within this setting. The study was reviewed and approved by the surveying institution's institutional review board (IRB-300006629).

Dependent Variables

The survey used validated measures from the Veteran's Affairs All Employee Survey (VA AES) to capture outcome variables of interest.³³ Psychological safety was measured by asking participants if "Members of my work group are able to bring up problems and tough issues." To measure sense of belonging, sense of recognition, and sense of respect, participants were asked if "I feel a sense of belonging at work", "I am satisfied with the recognition I receive for doing a good job", and "At my department or unit, I am treated with respect", respectively.³³ Items were measured with a response format of 1 (Strongly Disagree) to 5 (Strongly Agree).

Independent Variables

Independent variables were chosen by extensive literature search, content expertise, and stepwise regression modeling. To capture trainee experience with the organization and to assess participant belief that the organization values their contributions and cares about their well-being and satisfaction at work, a previously validated 3-item adaptation of the perceived organizational support measure was used. Responses were recorded using 5-point Likert scales, and composite scores were generated that ranged from 3 (lowest score) to 15 (highest score).³⁴ To capture interpersonal factors, trust and confidence in supervisor, role clarity, and autonomy were measured by asking participants if "I have trust and confidence in my direct supervisor", "I know exactly what is expected of me at work", and "I have control over how my work is carried out", respectively, as previously described.³³ Similarly, to assess individual factors, participant moral distress was measured by asking, "In the past 3 months, how often did you experience moral distress at work (i.e., you were unsure about the right thing to do or could not carry out what you believed to be the right thing)?"³³ Individual resilience was also measured using the abbreviated 2-item Connor-Davidson Resilience Scale. Response format ranged from 0 (Not true at all) to 5 (True nearly all the time) and items were combined to create a score that ranged from 0 (lowest score) to 8 (highest score).³⁵ Participant race, gender, and age demographics were collected. The majority (81.4%) of participants were 18–34 years old; therefore, the age variable was omitted from the study.

Data Analysis

Raw data were imported into Stata/SE 17.0 (Stata Corp., College Station, TX) for analysis. Due to sample size limitations, response formats to some survey items were collapsed. Specifically, psychological safety, sense of belonging, sense of recognition, and sense of respect were measured with a response format of 1 (Strongly Disagree) to 5 (Strongly Agree). Due to sample size, responses were collapsed into three categories, 1 (Disagree), 2 (Neutral), and 3 (Agree). Autonomy, role clarity, and trust and confidence in supervisor were measured with a response format of 1 (Strongly Disagree) to 5 (Strongly Agree) as previously described, then responses were collapsed to a response format of 1 (Disagree), 2 (Neutral), and 3 (Agree) for analyses. Moral distress was measured with a response format of 1 (None) to 6 (Almost every workday). For the purposes of this study, the response format was collapsed into 1 (Never), 2 (Occasionally, or a few times a month or less), and 3 (Often, or more than once a week). For gender, only one participant selected "Non-binary or self-describe". Therefore, we combined this case with "Female" and labeled the category

“Female and gender minorities”, as previously described.^{29,36,37} Similarly, race categories were collapsed into “White”, “Non-white”, and “Prefer not to answer” due to low response rates in race categories.

Variables were expressed as means with standard deviations or frequencies and percentages. Chi-squared and Fisher’s exact and analysis of variance (ANOVA) tests were conducted to test the association between psychological safety and all categorical variables or numeric variables, respectively. Multivariate ordinal logistic regression with robust estimators was used to predict the odds of feeling psychologically safe, a sense of belonging, a sense of recognition, and a sense of respect when considering organizational, interpersonal, and individual factors in this population of trainees. Predictors for each model were considered within the standard of at least 10 observations per parameter, and the absence of problematic multicollinearity was checked using variance inflation factor (VIF) values.³⁸ Of note, the VIF values of all variables were between 1.07 and 2.13. Model fit was assessed using pseudo R-squared values as well as Akaike and Bayesian information criteria. Dominance analysis was employed to understand the relative contribution of these variables to the variance in each model.³⁹

Results

Sample Descriptive Summary

At the time of survey, there were an eligible 23,697 employees of the surveying institution, holding a range of job roles within the academic medical center. Out of this total potential employee sample, a total of 1,620 were eligible trainees (eg, graduate students, postdoctoral fellows, medical and physician scientist (MD/PhD) students, residents, and fellows). At the end of the data collection period, a total of 6,466 participants completed the survey (27.3% total response rate). We narrowed the sample to include those who selected trainee job role designations. Out of the total eligible 1,620 trainees, 347 completed the survey (21.4% trainee response rate). Missing information was accounted for using list-wise deletion, omitting 112 cases, which resulted in a final analytic sample of 235. The sample majority was white (56.6%), followed by those who identified as other races (27.7%), and those who suppressed their race (15.7%). Nearly half of the sample identified as female or gender minority (48.9%), followed by males (42.1%), and those who suppressed their gender information (8.94%). Race ($p<0.01$) and gender ($p<0.05$) were both significantly associated with psychological safety.

Table 1 describes sample characteristics the statistical association of each variable with psychological safety. Over half of trainees reported feeling psychologically safe (62.1%) in their training environments. Most trainees reported autonomy (51.1%, $p<0.001$), role clarity (67.7%, $p<0.001$), and trust and confidence in their supervisor (80.4%, $p<0.001$). The average perceived organizational support score was 9.14 ($p<0.001$), similar to that of healthcare workers.⁴⁰ Trainees reported a sense of belonging (67.2%, $p<0.001$), recognition (51.9%, $p<0.001$), and respect (75.7%, $p<0.001$), with 16.2% reporting frequent moral distress ($p<0.001$). The mean resilience score of 6.24 was not significantly associated with psychological safety ($p=0.260$).

Multivariate Ordinal Logistic Regression

Psychological Safety

Table 2 represents the results of the multivariate ordinal logistic regression models used to understand the predictors associated with psychological safety. Those who indicated a sense of belonging (OR=2.27, $p<0.01$), recognition (OR=1.61, $p<0.05$), and respect (OR=1.77, $p<0.05$) had higher odds of feeling psychologically safe. Higher perceived organizational support scores (OR=1.14, $p=0.052$) were associated with higher odds of reporting psychological safety and approached significance. Compared to participants who identified as white, those who suppressed their race had lower odds of indicating psychological safety (OR=0.38, $p<0.05$). Similarly, compared to males, females and gender minorities had lower odds of feeling psychologically safe (OR=0.38, $p<0.01$). Using dominance analysis, the variables that explained the greatest overall contribution to the variance in the model were a sense of belonging (20.1%), recognition (18.5%), respect (13.6%).

Table 1 Descriptive Summary of Trainee Sample (n=235)

	Trainees (Medical and Biomedical) n=235		
	Mean (SD)	Freq (%)	p ^a
Psychological Safety	2.45(0.76)	146(62.1)	
Autonomy	2.26(0.83)	120(51.1)	0.000 ^{b,***}
Role Clarity	2.54(0.72)	159(67.7)	0.000 ^{b,***}
Trust and confidence in supervisor	2.72(0.61)	189(80.4)	0.000 ^{c,***}
Perceived Organizational Support Score (3–15)	9.14(2.8)		0.000 ^{d,***}
Sense of belonging	2.55(0.70)	158(67.2)	0.000 ^{c,***}
Sense of recognition	2.26(0.85)	122(51.9)	0.000 ^{b,***}
Sense of respect	2.69(0.60)	178(75.7)	0.000 ^{c,***}
Moral distress	0.89(0.65)	38(16.2)	0.000 ^{b,***}
Resilience Score (0–8)	6.24(1.35)		0.260 ^d
Race			0.002 ^{b,***}
White		133(56.6)	0.009 ^{b,***}
Non-white		65(27.7)	0.418 ^b
Prefer not to answer		37(15.7)	0.001 ^{b,***}
Gender			0.021 ^{c,*}
Male		99(42.1)	0.013 ^{b,*}
Female and gender minorities		115(48.9)	0.000 ^{b,***}
Prefer not to answer		21(8.94)	0.019 ^{c,*}

Notes: ^aSignificance of Chi-squared, Fisher's exact, and ANOVA tests determining the association between psychological safety and the predicting variable. ^bChi squared test. ^cFisher's exact test. ^dANOVA. *p<0.05, **p<0.01, ***p<0.001.

Table 2 Ordinal Logistic Regression Predicting Psychological Safety in Trainees (n=235)

	Psychological Safety						
	OR	SE	95% CI		p	Std. Domin Stat.	Rank
Sense of belonging	2.27	(0.61)	1.336	3.855	0.002**	0.201	1
Sense of recognition	1.61	(0.35)	1.048	2.481	0.030*	0.185	2
Sense of respect	1.77	(0.49)	1.034	3.030	0.037*	0.136	3
Trust and confidence in supervisor	1.38	(0.42)	0.759	2.502	0.292	0.117	4
Perceived Organizational Support Score (3–15)	1.14	(0.08)	0.999	1.303	0.052 [^]	0.095	5
Autonomy	1.15	(0.23)	0.783	1.688	0.476	0.042	10
Role Clarity	1.06	(0.29)	0.626	1.797	0.826	0.054	7
Moral distress	0.72	(0.18)	0.449	1.161	0.179	0.065	6
Resilience Score (0–8)	1.03	(0.12)	0.814	1.302	0.810	0.005	11
Race (Ref. = White)							
Non-white	0.63	(0.25)	0.283	1.383	0.247	0.053	8
Prefer not to answer	0.39	(0.17)	0.166	0.937	0.035*		
Gender (Ref. = Male)						0.049	9
Female and gender minorities	0.38	(0.14)	0.185	0.781	0.008**		
Prefer not to answer	0.84	(0.53)	0.244	2.912	0.787		
Model Fit							
Pseudo R2					0.267		
AIC					347.969		
BIC					399.862		

Note: [^]p< 0.1, *p<0.05, **p<0.01.

Abbreviations: OR, Odds Ratio; SE, Standard Error; CI, Confidence Interval; Std, Standard; Domin, Dominance; Ref, Reference; AIC, Akaike's Information Criteria; BIC, Bayesian Information Criteria.

Central Elements of Psychological Safety

Based on the results of the dominance analysis, we sought to further understand the top three predictors that explained the majority of the variance in the model for trainee psychological safety to extend the theory of this construct. We next explored a sense of belonging as an outcome variable (Table 3). Participants who felt senses of respect ($OR=2.69$, $p<0.01$) and recognition ($OR=1.70$, $p<0.05$) had higher odds of feeling a sense of belonging. Higher perceived organizational support scores ($OR=1.14$, $p<0.05$) and high trust and confidence in the supervisor ($OR=2.01$, $p<0.05$) were also associated with higher odds of reporting belonging. For this outcome, sense of respect (26.6%), trust and confidence in supervisor (20.7%), sense of recognition (16.2%), and perception of organizational support (10.4%) had the highest contribution to the variance in the model.

We next explored the variables that contribute to a sense of recognition (Table 4). Participants who felt a sense of respect ($OR=4.17$, $p<0.001$) and belonging ($OR=1.77$, $p<0.05$) had higher odds of reporting a sense of recognition. Interestingly, those who expressed that they had autonomy, or control over their work ($OR=1.46$, $p<0.05$), and those who had clarity about what was expected of them at work ($OR=1.74$, $p<0.05$) had higher odds of feeling a sense of recognition. Additionally, those with higher perceived organizational support scores ($OR=1.18$, $p<0.01$) had higher odds of feeling a sense of recognition in their training environments. Participants who reported a higher sense of recognition had lower odds of reporting moral distress ($OR=0.64$) and this relationship approached significance ($p=0.058$). Sense of respect (29.2%), sense of belonging (16.5%), perception of organizational support (13.9%), role clarity (13.7%), and autonomy (10.7%) contributed most highly to the variance in the model.

Table 5 describes the results of the model predicting sense of respect. Those who felt a sense of recognition ($OR=3.44$, $p<0.001$) and a sense of belonging ($OR=2.54$, $p<0.01$) had higher odds of feeling a sense of respect. Participants who cited trust and confidence in their supervisor ($OR=2.42$, $p<0.01$) had higher odds of reporting a sense of respect in their training environments. The majority of the variance in this model was explained by sense of recognition (27.3%), trust and confidence in supervisor (25.9%), and sense of belonging (25.3%).

Table 3 Ordinal Logistic Regression Predicting Sense of Belonging in Trainees (n=235)

	Sense of Belonging						
	OR	SE	95% CI		p	Std. Domin Stat.	Rank
Sense of recognition	1.70	(0.40)	1.061	2.707	0.027*	0.162	3
Sense of respect	2.69	(0.91)	1.383	5.231	0.004**	0.266	1
Trust and confidence in supervisor	2.01	(0.66)	1.056	3.814	0.033*	0.207	2
Perceived Organizational Support Score (3–15)	1.14	(0.07)	1.004	1.296	0.044*	0.104	4
Autonomy	1.06	(0.24)	0.676	1.659	0.802	0.031	8
Role Clarity	1.37	(0.40)	0.769	2.439	0.285	0.102	5
Moral distress	0.78	(0.23)	0.440	1.377	0.389	0.058	6
Resilience Score (0–8)	1.04	(0.13)	0.813	1.338	0.743	0.003	10
Race (Ref. = White)						0.057	7
Non-white	0.60	(0.23)	0.289	1.261	0.180		
Prefer not to answer	0.48	(0.30)	0.146	1.611	0.237		
Gender (Ref. = Male)						0.011	9
Female and gender minorities	1.26	(0.48)	0.597	2.667	0.543		
Prefer not to answer	0.60	(0.41)	0.156	2.300	0.455		
Model Fit							
Pseudo R2	0.285						
AIC	312.587						
BIC	361.021						

Note: * $p<0.05$, ** $p<0.01$.

Abbreviations: OR, Odds Ratio; SE, Standard Error; CI, Confidence Interval; Std, Standard; Domin, Dominance; Ref, Reference; AIC, Akaike's Information Criteria; BIC, Bayesian Information Criteria.

Table 4 Ordinal Logistic Regression Predicting Sense of Recognition in Trainees (n=235)

	Sense of Recognition						
	OR	SE	95% CI		p	Std. Domin Stat.	Rank
Sense of belonging	1.77	(0.49)	1.033	3.029	0.038*	0.165	2
Sense of respect	4.17	(1.11)	2.471	7.028	0.000***	0.292	1
Trust and confidence in supervisor	0.84	(0.22)	0.497	1.417	0.512	0.070	6
Perceived Organizational Support Score (3–15)	1.18	(0.07)	1.048	1.335	0.007**	0.139	3
Autonomy	1.46	(0.26)	1.023	2.077	0.037*	0.107	5
Role Clarity	1.74	(0.44)	1.063	2.852	0.028*	0.137	4
Moral distress	0.64	(0.15)	0.399	1.015	0.058^	0.066	7
Resilience Score (0–8)	1.05	(0.12)	0.845	1.301	0.606	0.004	10
Race (Ref. = White)						0.008	9
Non-white	0.61	(0.21)	0.312	1.197	0.151		
Prefer not to answer	1.33	(0.83)	0.390	4.536	0.648		
Gender (Ref. = Male)						0.011	8
Female and gender minorities	0.65	(0.22)	0.339	1.263	0.207		
Prefer not to answer	0.53	(0.44)	0.106	2.663	0.443		
Model Fit							
Pseudo R2					0.264		
AIC					382.250		
BIC					430.684		

Note: ^p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Abbreviations: OR, Odds Ratio; SE, Standard Error; CI, Confidence Interval; Std, Standard; Domin, Dominance; Ref, Reference; AIC, Akaike's Information Criteria; BIC, Bayesian Information Criteria.

Table 5 Ordinal Logistic Regression Predicting Sense of Respect in Trainees (n=235)

	Sense of Respect						
	OR	SE	95% CI		p	Std. Domin Stat.	Rank
Sense of belonging	2.54	(0.82)	1.352	4.777	0.004**	0.253	3
Sense of recognition	3.44	(0.77)	2.217	5.326	0.000***	0.273	1
Trust and confidence in supervisor	2.42	(0.78)	1.283	4.557	0.006**	0.259	2
Perceived Organizational Support Score (3–15)	1.02	(0.09)	0.858	1.202	0.854	0.050	5
Autonomy	0.98	(0.27)	0.576	1.682	0.953	0.021	6
Role Clarity	1.34	(0.38)	0.777	2.327	0.290	0.083	4
Moral distress	1.47	(0.51)	0.748	2.891	0.263	0.017	9
Resilience Score (0–8)	0.78	(0.12)	0.576	1.057	0.109	0.017	8
Race (Ref. = White)						0.018	7
Non-white	1.15	(0.56)	0.439	3.009	0.777		
Prefer not to answer	0.51	(0.30)	0.161	1.587	0.242		
Gender (Ref. = Male)						0.008	10
Female and gender minorities	1.16	(0.52)	0.481	2.780	0.744		
Prefer not to answer	1.19	(0.90)	0.270	5.268	0.817		
Model Fit							
Pseudo R2					0.340		
AIC					245.708		
BIC					294.142		

Note: **p<0.01, ***p<0.001.

Abbreviations: OR, Odds Ratio; SE, Standard Error; CI, Confidence Interval; Std, Standard; Domin, Dominance; Ref, Reference; AIC, Akaike's Information Criteria; BIC, Bayesian Information Criteria.

Discussion

The purpose of this study was to empirically examine the correlates of psychological safety in trainees. Psychological safety is a critical component of group development and performance, as creating conditions that are conducive to the emergence and evolution of ideas is essential for learning. However, leaders, mentors, and supervisors may have less clarity on what conditions or behaviors can tangibly create an environment in which trainees feel safe. This work highlights the correlates of psychological safety specific to trainees, an area of scant empirical exploration. Further, our work provides a more detailed analysis of the three predictors that explained the majority of the variance in the model predicting psychological safety. Here, we describe psychological safety within training environments by contributing to the understanding of the construct as it relates to trainees through organizational, interpersonal, and individual factors.

Central Elements of Psychological Safety

Our findings suggest that the main factors of psychological safety in trainees are belonging, recognition, and respect. The first is consistent with previous work that suggests an inclusion threshold must be met before psychological safety can begin to form.⁴¹ Four conditions must be present to achieve this sense of belonging: competencies (including the ability to form relationships), opportunities, motivation, and perceptions of belonging.⁴² Further, belonging and inclusion are essential for the creation of structure, goal setting, and defining direction and goals.^{10,43} To this end, a supportive learning environment is associated with belonging and, further, students who feel a sense of belonging are more likely to report higher self-efficacy and task value, leading to higher engagement.⁴⁴ In fact, organizations that foster inclusivity have higher overall work performance,⁴⁵ suggesting that belonging directly impacts organizational outcomes. Leaders can address belonging in a variety of ways including skill development and coaching, creating connection mechanisms, and addressing behaviors that may create perceptions of favoritism, discrimination, or racism.

Our work is consistent with prior studies demonstrating that employee recognition leads to increased psychological safety, which has many benefits including adaptive behavior, as well as lower burnout and turnover rates.^{46,47} While recognition is commonly given for large milestones, recognizing employees for smaller accomplishments is linked to feeling engaged with both the workplace and the work.⁴⁸ Recognition is commonly accomplished by praising trainees for a job well done, which helps to encourage motivation and innovation.⁴⁹ We and others suggest that recognition should move beyond this congratulatory concept, towards high-quality practices of listening to feedback regarding work processes, experience, and innovative ideas.^{17,50} As such, recognition can be leveraged by management and leadership behavior by acknowledging and addressing employee concerns, which creates perceptions of support and trust.⁵¹ Conversely, recognition of trainees can be thwarted by dismissing judgment or hierarchal intimidation, implicit behaviors that cause moral distress and erosion, instead of growth.^{52,53}

Psychological safety also depends on a level of confidence derived from respect.¹ Individuals may show respect in one area, but fail in another area, leading to overall feelings of disrespect. For example, a mentor may respect the skills of the trainee, but expect the trainee to be available for work during unconventional hours, thus creating a feeling of disrespect of the trainee's responsibilities outside of work. As such, respect is associated with the concept of hidden curriculum, in which positive rhetoric is counteracted by negative behavior. Respect is fundamental for psychological safety, in part for the ability to engage in debate and critical thinking processes necessary for innovation.¹⁸ By modeling disrespectful behavior, individuals, especially those in positions of power, could inadvertently imply that trainees are of less value and are less deserving of respect than others. Feeling respected can be influenced by individual behaviors, including respect for time, expertise, personal boundaries, and career goals. Psychological safety therein is supported by respect for each individual within the environment, allowing for high levels of work engagement.⁵⁴

Organizational Factors

Vertical interactions in the workplace are ubiquitous, yet hierarchal power dynamics can impede the learning process.⁵⁵ Our results demonstrate the importance of these interactions in fostering psychological safety, particularly through perceptions of organizational support. We found that perception of organizational support is closely related to belonging

and recognition, indicating a trainee's sense of significance within the organization. This aligns with organizational support theory, which suggests that belonging and approval are basic needs of individuals.⁵⁶

Trainees support the mission of institutions by supporting and even leading initiatives.⁵⁷ However, trainees may often be viewed as transient within the organization,⁵⁸ as it is common to leave for further training or jobs in other organizations after program completion.⁵⁹ As such, trainees often have wide variation in benefits they receive across organizations⁶⁰ and may receive less prioritization for organizational investment.⁶¹ Paradoxically, organizational investment in employees is known to augment both in-role and extra-role efforts, with additional benefits such as higher employee engagement and lower withdrawal behavior.⁶² We suggest that low perception of organizational support hampers trainee psychological safety, as they may be less likely to feel as though their opinion matters. However, it would benefit organizations to invest in trainees, as studies demonstrate that programs that regularly assess and work to improve trainee organizational support and psychological safety measures have higher program evaluation scores.²¹

Interpersonal Factors

The Role of the Supervisor

A feeling of trust and confidence in one's supervisor was associated with greater senses of belonging and respect, both core human needs.⁶³ This suggests that if a trainee feels that the acquisition of these needs is threatened, then they are less likely to trust their mentor or supervisor. Mentors and supervisors are meant to share knowledge, give encouragement and feedback, help obtain opportunities, and encourage individual identity development.⁶⁴ Our findings suggest an association between a sense of belonging and trust and confidence in the supervisor, highlighting the influence of mentoring on perception of inclusion safety.⁶⁵ Furthermore, we suggest a co-dependent relationship between trainee belonging and respect that is facilitated by the supervisor: trainees must feel that they can trust their supervisors to feel belonging, and a sense of respect is derived from being able to form that trusting relationship. Leaders can build trust by discussing what matters most to their trainees and creating a work environment that protects those needs, and demonstrating learning empathy.⁶⁶

Role Clarity

Here, we highlight the importance of role clarity as a means of trainee support through transparent communication. Role clarity is achieved when employees understand exactly what is expected of them at work.⁶⁷ Without it, role ambiguity perpetuates distress and disengagement,⁶⁸ threatening inclusion safety. Role clarity was a significant predictor of a sense of recognition, suggesting that trainees who understood their responsibilities and degree of authority were more likely to feel satisfied with their recognition. Providing role clarity allows trainees to perform better, not only because they understand how their role fits within the team but also because this factor facilitates trust, productivity, and overall work performance.⁶⁹ We suggest that improved trainee role clarity can be achieved by openly communicating role expectations, aligning expectations with the overall goals of the organization, and thus granting the trainee agency over their work. Furthermore, as trainees develop expertise within their field, regular communication aimed at expanding role responsibilities and resource acquisition using the practice of job crafting could be of use.⁷⁰ As the theory of job crafting emerged as a method to increase organizational effectiveness in quickly evolving workplaces,⁷¹ the fast-paced nature of training environments could benefit from regular communication about role responsibilities that allow for the continuous leverage of trainee skillset and interest.

Autonomy

Our data further contribute to the construct of interpersonal psychological safety by suggesting the significance of trainee autonomy through the lens of recognition. We suggest that allowing trainees to play a larger role in the design and execution of their work has direct impacts on their perception of being recognized and valued as an important member of the workforce. In fact, trainee autonomy allows the development of decision-making skills, confidence, and responsibility over their work,⁷² preparing them for independent career trajectories.⁷³ Conversely, micromanaging behaviors or discounting trainee input thwarts learning.^{11,74} Of note, when out of balance, too much or too little autonomy can

deleteriously affect both the trainee and the organization.⁷⁵ Using a relational approach, a balance of autonomy and supervision can be achieved wherein trainees are allowed to develop independence while still reaching positive organizational outcomes. Aside from encouraging trainees to work independently, autonomy can be satisfied through involving trainees in important learning opportunities outside of their role responsibilities. Involvement in decision-making processes, budgeting, and personnel management introduces concepts that support skill building in autonomy while also exposing trainees to valuable and necessary skills not otherwise taught in their training curricula. Moreover, granting a sense of autonomy provides a sense of control in regard to actions, work, and related consequences,^{76,77} giving trainees a sense of power and meaning in their work,^{77,78} which mitigates burnout.⁷⁹ Similar to achieving role clarity, the job crafting framework has been shown to be effective in increasing perceived autonomy support and leveraging individual volition and initiative,⁸⁰ which we suggest is an effective form of recognition.

Individual Factors

Female and gender minorities and those who suppressed their race reported feeling less psychologically safe in this study, which suggests minority identity and the suppression demographic information may indicate a broader fear of speaking up. This is in alignment with the finding that inclusivity is a crucial first step in creating a psychologically safe environment.¹¹ While there have been efforts to increase the diversity of the working population, it appears that marginalized individuals may still experience barriers to feeling supported in bringing their perspectives and ideas to the work. Furthermore, having diverse individuals in the room falls short of the goal of creating an inclusive environment for marginalized individuals. While a seat at the table matters,⁸¹ a voice at the table is not guaranteed merely by the presence of marginalized individuals in the training environment.

Moral distress is recognized as an occupational hazard⁸² and is compounded by lack of support and psychological safety in work settings.⁸³ In the present study, work-derived moral distress was significantly associated with psychological safety and approached significance in its prediction of sense of recognition. This suggests that trainees may feel more comfortable speaking up about moral, ethical, or challenging dilemmas if they feel that their importance is recognized within the organization. Concerningly, individuals are more likely to compromise their trust in their disciplines than report misconduct by mentors et al for fear of retribution,⁸⁴ highlighting the importance of challenger safety wherein trainees feel that they can challenge the status quo.¹¹ This is of particular significance, as negative supervision and perception of organizational politics were found to enable moral disengagement, leading to negative organizational citizenship behaviors, lower task performance, alongside incidence of misconduct and turnover intent.⁸⁵

This work further demonstrates that individual resilience was neither associated with nor predictive of psychological safety or its main constituents. This builds on previous work that individual resilience may have a lesser role in employee experiences than the working conditions individuals endure daily.^{36,40} This supports the argument that prescriptive resiliency training is ineffective for solving trainee dissatisfaction, especially when training is not coupled with meaningful organizational change.

Limitations

There are a few limitations to this study. First, data are cross-sectional and were collected at a single institution, limiting the exploration of causality or directionality of the results and generalizability to other settings. Furthermore, these data were from an enterprise-wide engagement survey. Informed by our findings, we hypothesize that low response rates may be at least in part explained by trainees feeling as though they are neither considered employees nor important members of the organization. Considering sample size limitations, careful consideration was taken of the number of predictors allowed in each model to help ensure reliable estimates, alongside model fit, absence of multicollinearity, and the use of robust estimators in the regression models. Additionally, due to sample size limitations, all trainees were combined into a single category, limiting interpretation of specific roles. Further, data collection from an employee engagement survey limits our ability to capture measures of interest more rigorously. As such, some single-item measures were used to capture outcomes of interest, though this is common in organizational research;⁸⁶ however, this may limit a deeper assessment of the constructs. Measures were largely derived from the Veteran's Affairs All Employee Survey (VA AES). While these measures are short form, the VA publishes national results of their surveys every year, which allows us the

unique opportunity to externally benchmark the experience of the trainee within the academic medical center as they relate to other employees in the same setting, the subject of future research. Regardless of these limitations, measurement in this capacity shed light on trainee experience within this setting and lays the groundwork for further, more rigorous inquiry. Overall, this study contributes to a gap in the literature pertaining to the crucial support of trainees. Future research should focus on the difference between clinical and biomedical trainee experience, the needs of each trainee group, and the unique factors that influence psychological safety in these distinct populations.

Conclusion

Here, we highlight the multidimensional nature of trainee psychology with important insights from organizational, interpersonal, and individual factors. We expand upon the existing understanding of psychological safety by introducing the significance of role clarity and autonomy to achieving a sense of recognition in trainees. Our data further suggest that the skills and behaviors that facilitate successful careers differ from the skills needed to foster healthy work environments. To promote engaged and innovative trainees, organizations should invest in curricula that develop a broader skill set beyond technical proficiency. Educating trainees both in technical and managerial aspects is crucial for holistic development. Prioritizing psychological safety therein is a feed forward process that influences the culture to welcome challenges that lead to innovation, without unnecessary distress derived from feeling unsafe.

Data Sharing Statement

The datasets generated and used for this study are not publicly available due to the sensitive nature of its contents; however, de-identified data are available from the corresponding author on reasonable request.

Ethics Statement

This study was reviewed and approved by the University of Alabama at Birmingham Institutional Review Board. IRB Approval Date and Identification Number: May 25, 2022; IRB-300006629. This study was conducted in accordance with the World Medical Association (WMA) Declaration of Helsinki.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

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