A test of safety, violence prevention, and civility climate domain-specific relationships with relevant workplace hazards

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Background: Safety climate, violence prevention climate, and civility climate were independently developed and linked to domain-specific workplace hazards, although all three were designed to promote the physical and psychological safety of workers.
Purpose: To test domain specificity between conceptually related workplace climates and relevant workplace hazards.
Methods: Data were collected from 368 persons employed in various industries and descriptive statistics were calculated for all study variables. Correlational and relative weights analyses were used to test for domain specificity.
Results: The three climate domains were similarly predictive of most workplace hazards, regardless of domain specificity.
Discussion: This study suggests that the three climate domains share a common higher order construct that may predict relevant workplace hazards better than any of the scales alone.

Keywords: Safety climate, Violence prevention climate, Civility climate, Workplace accidents, Workplace mistreatment

Workers may be exposed to both physical and psychological hazards in the workplace. Physical and psychological hazards include accidents, overexertion,[1] and mistreatment (i.e. incivility and violence, both physical and nonphysical)[2,3] and may lead to workplace injuries and illnesses.[4–9] Organizations pay a heavy price for workplace injuries and illnesses in terms of employee health, safety, and well-being, lost productivity, increased absenteeism, and workers' compensation costs.[10–15] In 2014, the US Bureau of Labor Statistics (BLS) reported a total of 4,679 occupational deaths in the US and nearly three million nonfatal occupational injuries and illnesses in the private (excludes military and government workers) sector alone. Over half of these injuries or illness resulted in absentee days, job transfer, or restriction.[1]

Identifying antecedents to workplace hazards can assist in the design of workplace interventions to reduce risk factors and their associated costs for employees and employers alike. One such antecedent is workplace climate, defined as socially constructed perceptions of the work environment that inform appropriate workplace behaviors and organizational goals.[7,16] Workplace climates are operationalized through formal and informal workplace policies, procedures, and leadership behaviors.[7,16] For the purposes of this research, we chose three discrete facets of workplace climate specifically developed to promote the physical and psychological safety of employees: (1) safety climate (e.g. prevention of workplace injuries and accidents)[4]; (2) violence prevention climate (prevention of physical and nonphysical violence)[2,5]; and (3) workplace civility climate (prevention of incivility among people at work).[3,8]

To date, the literatures on safety climate, violence prevention climate, and civility climate have been distinct, with studies limiting outcomes (i.e. exposure to workplace hazards) to the corresponding climate domain. Specifically, safety climate has been theoretically and empirically related to workplace accidents and the consequences of overexertion (i.e. musculoskeletal disorders (MSDs)).[4,17,18] Violence prevention climate has been theoretically and empirically linked to workplace physical and nonphysical violence, [2,5,19] and civility climate has been connected to workplace incivility exposure and interpersonal conflict. [3,8] However, all three climate constructs are conceptually overlapping in that each is concerned with creating safer workplaces and decreasing and preventing injury, both physical and psychological, to employees.

This study contributes to the existing literature by linking three important types of workplace hazards that jeopardize the physical and psychological well-being of employees: accidents and overexertion, incivility, and violence, both physical and nonphysical. By examining the relationships among three workplace climate constructs and workplace hazards, this study will show whether

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independently developed, yet related workplace climates overlap (i.e. being high on one is associated with being high on another) and are related to hazards typically linked to the other climate domains. Consistent with the principle of specificity, domain-specific relationships are expected to be stronger than cross-domain relationships.[20] Whether or not domain specificity holds in this context has not been tested. Results can be used to provide guidance to organizational climate researchers on whether it makes sense to continue to study these workplace climates and related hazards in isolation and whether workplace interventions should be designed more broadly to achieve related organizational goals, in this case, the physical and psychological safety of employees. Therefore, we propose the following hypotheses:

Hypothesis 1: Each workplace climate will have negative relationships with the following outcome variables: accidents, MSDs, physical and nonphysical violence, incivility exposure, and interpersonal conflict.

Hypothesis 2: (a) Safety climate will have stronger negative relationships with accidents and MSDs than will violence prevention climate and civility climate; (b) Violence prevention climate will have stronger negative relationships with physical and nonphysical violence than will safety climate and civility climate; (c) Civility climate will have stronger negative relationships with interpersonal conflict and incivility exposure than will violence prevention climate and safety climate.

Methods

Participants

The study included 368 persons employed for a minimum of 20 hours a week, all of whom were recruited from courses at a large southeastern urban university in the US. At the time of the survey, participants had an average tenure of two years at their current jobs.

While participants worked in a variety of industries, approximately 36 percent of this sample worked in the retail industry (e.g. cashier, wait staff, manager) and approximately 13 percent worked in the healthcare industry (e.g. healthcare administrator, nurse, therapist). Retail and healthcare industries represent two of the three industries with the highest rates of nonfatal injuries and illnesses and MSDs.[21,22]

Recruitment

Participants were recruited from the Department of Psychology human subjects pool, a web-based system that allows participation in studies by logging into web-based surveys. All participants were informed of the nature and content of the questionnaire prior to participation. The authors received IRB approval for the research protocol prior to data collection (IRB# Pro00007241). Our data collection procedures required each participant to answer each item of each measure before the participant could continue to the next measure, resulting in no missing data.

Measures

Safety climate

Safety climate was measured using the National Institute for Occupational Safety and Health (NIOSH) short Safety Climate Scale.[23] This scale consists of six items and four response options ranging from *Strongly Disagree* to *Strongly Agree*. For analysis purposes, participant scores on all items were aggregated into an overall safety climate scale score, with higher scores indicating a more positive safety climate.

Violence prevention climate

A 12-item multi-dimensional Violence Prevention Climate Scale (VPC) was used.[2] This scale consists of three dimensions: (1) violence practices and responses; (2) violence policies and procedures; and (3) pressure against violence prevention. There were six response choices from *Strongly Disagree* to *Strongly Agree*. For confirmatory factor analysis purposes, the three dimensions of the VPC were considered separately. For hypotheses testing, participant scores on all three dimensions were aggregated into one overall violence prevention climate scale score, with higher scores indicating a more positive violence prevention climate.

Perceived workplace civility climate

The 13-item Perceived Workplace Civility Climate (PWCC) Scale assessed the extent to which the participants perceived the importance their organization places on managing and preventing incivility in the workplace.[3] The scale has six response options ranging from *Strongly Disagree* to *Strongly Agree*. For analysis purposes, participant scores on all items were aggregated into an overall civility climate scale score, with higher scores indicating a more positive civility climate.

Musculoskeletal disorders

The 9-item Standardized Nordic Questionnaire assessed work-related musculoskeletal injuries (MSDs) over the past year.[24] Participants were asked to respond whether or not (i.e. yes or no) they experienced an injury to any of nine body parts (e.g. wrist/hand, neck, lower back) while at work. An overall measure of MSDs was used in this study, with a higher score representing more injuries.

Accidents

Accident exposure was assessed using a 3-item measure adapted from Hayes, Perander, Smecko, and Trask.[25] Specifically, participants were asked:

Table 1 Descriptive statistics, intercorrelations, and internal consistency estimates for this study's focal variables

Variables	Range	*M*	SD	1	2	3	4	5	6	7	8	9
1. Safety climate	1.00–4.00	3.08	.60	.88								
2. Violence Prevention climate	1.42–6.00	4.46	.98	.60**	.87							
3. Civility climate	1.31–6.00	4.20	1.00	.59**	.68**	.89						
4. Accidents	3.00–14.00	4.57	2.20	–.24**	–.31**	–.23**	.68					
5. MSD	9.00–18.00	10.71	2.29	–.19**	–.22**	–.19**	.43**	.77				
6. Nonphysical violence	1.00–6.00	1.32	.71	–.21**	–.29**	–.31**	.37**	.24**	.71			
7. Physical violence	1.00–5.73	1.19	.60	–.21**	–.25**	–.23**	.38**	.11*	.80**	.96		
8. Incivility exposure	1.00–6.00	1.84	1.07	–.31**	–.37**	–.48**	.37**	.38**	.62**	.45**	.95	
9. Interpersonal conflict	1.00–5.00	1.62	.81	–.25**	–.37**	–.41**	.41**	.31**	.62**	.52**	.72**	.84

Note: Cronbach's Alpha coefficients are along the diagonal enclosed in parentheses.
*Correlation is significant at the .05 level (two-tailed).
**Correlation is significant at the .01 level (two-tailed).

> How many times have the following things happened to you at work in the past year: (1) I had an accident at work that I reported to a supervisor (reported accidents); (2) I had an accident at work that I did not report to a supervisor (unreported accidents); and (3) I had a near accident at work (something that could have caused injury but did not) (near accident).

There were five response choices ranging from *Never* to *Four or more times*. For analysis purposes, participant scores were aggregated into an overall accident scale score, with higher scores representing more exposure to accidents.

Physical and nonphysical violence

The 14-item Workplace Aggression Research Questionnaire (WAR-Q) assessed workplace exposure to physical (11 items) and nonphysical (3 items) violence within the past year.[26] Response options ranged from 1 (*Never*) to 6 (*Daily*). For analysis purposes, participant scores were aggregated to represent the two distinct constructs: physical and nonphysical violence. Higher scores indicate more violence exposure.

Incivility exposure

An abbreviated 11-item version of a workplace incivility measure developed by Penny and Spector assessed workplace exposure to acts of incivility and other discourteous nonphysical behaviors within the past year.[27] Response options ranged from 1 (*Never*) to 6 (*Daily*). For analysis purposes, participant scores on all items were aggregated into an overall incivility exposure scale score, with higher scores indicating more exposure to incivility.

Interpersonal conflict

Interpersonal conflict at work was assessed using a 4-item measure developed by Spector and Jex.[28] Response options ranged from 1 (*Never*) to 5 (*Daily*). For analysis purposes, participant scores on all items were aggregated into an overall interpersonal conflict scale score, with higher scores indicating more interpersonal conflict.

Results

Demographics

The sample of this study consisted of 75 males and 293 females. The mean age of the participants was 22 years (SD = 4.4 years), with a range from 18 to 54 years old.

Descriptive statistics

The means, standard deviations, intercorrelations, and internal consistencies (Cronbach's alphas) are presented in Table 1. Cronbach's alpha coefficients, with one exception, were greater than .70, with six of nine exceeding .80, and the climate variables were all moderately correlated. As a result, we conducted a confirmatory factor analysis (CFA) to ensure that the items corresponding to the five latent climate constructs (i.e. one that corresponded to each of safety and civility climate and three that corresponded to each of the three dimensions of violence prevention climate) loaded on their respective factors. We used *MPlus* version 7 structural equation modeling software and the maximum likelihood method of estimation. We assessed model fit by examining the following fit indices: the chi-square statistic, the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the standardized root-mean-square residual (SRMR). All latent variables were allowed to correlate. Based on the model results, this measurement model was a good fit to the data ($X^2(421) = 1036.082$; $P < .01$; RMSEA = .06; CFI = .93; TLI = .92; SRMR = .06).[29,30] Standardized factor loadings ranged from .57 to 95, with each item loading onto its own factor without exception. Civility climate was significantly related to each of the three dimensions of violence prevention climate (r = .42 to .65) and to safety climate (r = .78), while each of the three dimensions of violence prevention climate was significantly related to safety climate (r = .25 to .66). Moreover, this model was a much better fit to the data than a single-factor model wherein all items loaded onto one climate factor ($X^2(434) = 4640.450$; $P < .01$; RMSEA = .16; CFI = .49; TLI = .45; SRMR = .13).

Table 2 Within- vs. cross-domain comparisons using t-tests

Domain-specific outcome	*r* within domain	*r* across domain	*t*-value
Accidents			
Safety Climate[a]	–.24		–
VPC		–.31	1.57
Civility Climate		–.23	–.22
MSD			
Safety Climate[a]	–.19		–
VPC		–.22	.66
Civility Climate		–.19	0
Physical violence			
VPC[a]	–.25		–
Safety Climate		–.21	–.88
Civility Climate		–.23	–.49
Nonphysical violence			
VPC[a]	–.29		–
Safety Climate		–.21	–1.78
Civility Climate		–.31	.5
Interpersonal conflict			
Civility Climate[a]	–.41		–
Safety Climate		–.25	–3.69**
VPC		–.37	–1.05
Incivility exposure			
Civility Climate[a]	–.48		–
Safety Climate		–.31	–4.07**
VPC		–.37	–2.99**

[a]The first climate variable listed under each outcome variable is the climate (within-domain) against which all other listed climates (cross-domain) are compared.
**Parameter estimate is significant at the .01 level (two-tailed).

Table 3 Relative weights analysis results for relative contribution of climate predictors to study outcomes

Predictors	Accidents	MSDs	Physical violence	Nonphysical violence	Incivility exposure	Interpersonal conflict
Safety Climate	.024* (24.8%)	.015 (27.5%)	.017 (24.7%)	.016 (14.3%)	.036* (15.5%)	.021 (11.2%)
VPC	.054* (55.1%)	.025* (44.6%)	.029* (41.2%)	.042* (38.4%)	.057* (24.8%)	.066* (35.9%)
Civility Climate	.020* (20.1%)	.015 (27.8%)	.024 (34.2%)	.051* (47.2%)	.138* (59.7%)	.097* (52.9%)
R^2	.10	.06	.07	.11	.23	.18

Notes: Values are relative weights that represent the proportion of total outcome variances explained by predictors. Values in parentheses are relative weights as percentage of total R^2. VPC = Violence Prevention Climate.
*Indicates that a relative weight is significantly different from zero as determined by the bootstrapping procedure presented in Tonidandel et al. (2009).

Within- vs. cross-domain relationships

Table 1 shows that safety climate, violence prevention climate, and civility climate had statistically significant negative relationships with each outcome variable, supporting Hypothesis 1.

Hypothesis 2 proposed that foregoing negative relationships would be stronger within-domain than cross-domain. As summarized in Table 2, a series of t-tests for dependent correlations confirmed that neither safety climate nor violence prevention climate had stronger zero-order correlations with their respective domain-specific outcomes than the other two climates of interest to this study. In other words, the climates were similarly predictive of workplace hazards, regardless of domain specificity. Conversely, civility climate did have stronger relationships with its domain-specific outcomes (i.e. interpersonal conflict and incivility exposure) than safety climate or violence prevention climate, with one exception. Civility climate and violence prevention climate were similarly predictive of interpersonal conflict.

To further test the relative importance of each of the climate variables in predicting the outcome variables, we conducted a series of relative weight analyses.[31–33] We utilized relative weight analyses rather than multiple regression analyses because, when multiple predictors are intercorrelated, as the climate constructs are in this study, a standard regression weight is an inappropriate index of the relative contribution of predictors to total variance in an outcome variable.[31–33] We also used Tonidandel and LeBreton's bootstrapping procedure to examine whether the relative weights were significantly different from zero.[33]

The results of our relative weights analyses are summarized in Table 3. For purposes of these analyses, each outcome was regressed on all climate predictors simultaneously. In accordance with the principle of specificity, we expected the climate variable that most closely corresponds with an outcome (e.g. safety climate and accidents) to be the most important predictor of that outcome when compared to the other cross-domain climate variables (Hypotheses 2). The relative weight analyses, however, suggest that domain specificity does not dictate which climate will explain the most predictive variance in any given outcome.

In explanation, safety climate did not explain the most predictive variance in any of this study's outcomes, including accidents and MSDs. Violence prevention climate explained the most predictive variance in accidents (55.1%) and MSDs (44.6%). Violence prevention climate also explained the most predictive variance in physical violence (41.2%), while civility climate explained the most predictive variance in nonphysical violence (47.2%), incivility exposure (59.7%), and interpersonal conflict (52.9%). Taken together, the foregoing correlational and relative weights analyses reveal only partial support for Hypothesis 2.

Discussion

The purpose of the current study was to integrate three streams of research concerning physical and psychological workplace hazards (i.e. accidents and overexertion, violence, and incivility) that have been treated independently in the literature. We focused our investigation on the relationships between three conceptually related workplace climates (i.e. safety, violence prevention, and civility) and these hazards. Consistent with the principle of specificity, we expected to find that relationships between climate and hazards would be stronger within-domain than cross-domain, but in fact, the general trend that emerged across both correlational and relative weights analyses suggests that safety climate, violence prevention climate, and civility climate are predictive of most of the hazards included in this study, regardless of domain specificity. Overall, this study suggests that the three independently developed workplace climates overlap both conceptually and empirically, and thus, relate to workplace hazards in other climate domains also developed to improve employee safety and well-being. These results may serve as a warning to organizational climate scholars against specifying too many distinct climates without first considering their overlap with other climates that predict similar outcomes. In explanation, while the climate constructs may be theoretically distinct, participants may be unable to reliability distinguish among them.[34] This could be due to the limited cognitive capability, measurement issues, or to biases (i.e. happy employees tend to rate their organizations as good on everything, whereas unhappy people tend to do the opposite).[34]

There are several potential explanations for these results. First, these results might suggest that the three climate domains share a common higher order construct that may predict relevant workplace hazards better than any domain alone. Given the conceptual overlap among the three climate domains, we believe that this explanation is most likely and deserves future research attention. To provide preliminary support for this explanation, we ran a supplementary CFA analysis to test whether or not the three climate domains share a common higher order factor using *MPlus* (v.7) software. Model results indicated that this measurement model was a good fit to the data ($X^2(426) = 1092.074$; $P < .01$; RMSEA = .06; CFI = .92; TLI = .91; SRMR = .07).[29,30] Each dimension of the three climate domain variables significantly loaded onto the higher order factor modeled therein. Thus, an organization that cares for the safety, health, and well-being of its employees is likely to promote a positive workplace climate that reduces exposure to all events (e.g. accidents, overexertion, and mistreatment) likely to cause psychological and/or physical harm to employees. Organizations should consider this evidence when designing and implementing workplace climate interventions. In the specific case of worker safety and well-being, designing climate interventions that are broader in scope may positively influence safety and prevention better than more narrow interventions, saving the organization both time and money.

Our results also might reflect the unintended consequences of implementing domain-specific policies and practices for the protection of employees. In other words, policies and practices intended to reduce one outcome might spillover and induce people to be more careful at work in general. There also might be conceptual overlap in the content of items (i.e. item overlap). Thus, an item that is intended to reflect one form of climate might inadvertently tap into another. Finally, the failure to find domain specificity with accidents and violence might have been due to restriction of range, as the base rates for both were quite low. This was not the case with incivility exposure and interpersonal conflict, which might explain why civility climate emerged as the strongest predictor of within-domain outcomes.

Future research directions

First, given the relative independent development of the literatures on safety climate, violence prevention climate, and civility climate, it is somewhat surprising that these climate scales were similarly predictive of relevant workplace hazards, regardless of domain specificity. As such, the three climate domains might share a common higher order construct that may predict relevant workplace hazards better than any domain alone. To our knowledge, no research tests these propositions directly. Combining these

three distinct literatures might reduce loss of information across domains, and thus, provide more practical and theoretical coherence.

Second, further theory development in this area would be beneficial. Much of the relevant literature fails to provide cogent theoretical arguments for why and to what extent safety climate, violence prevention climate, or civility climate, independently or in combination, might affect important employee and organizational outcomes. For example, why and under what circumstances might the three climate constructs work together to reduce physical and/or psychological harm to employees?

Finally, a review of the relevant climate literature reveals a dearth of group-level research in the areas of violence prevention and civility climate. Workplace climate can be measured at the individual level (psychological climate) or group level (organizational climate). More group-level research is required to understand how climate effects might vary depending on the level of measurement. Nascent research suggests that those climate effects tested thus far are similar across both levels.[8,17,19]

Limitations and conclusions

One limitation is the cross-sectional design of the study, which is unable to shed much light on whether these outcomes are the result of climate, the reverse, or if climate was merely a concomitant. However, there is evidence in the violence prevention climate literature suggesting that climate can lead to outcomes but not the reverse. Therefore, there is reason to suspect that relationships found here might reflect effects of climate.[35,36]

These results also might be limited to the instruments used in this study to measure the climate constructs, particularly the NIOSH safety scale. A positive safety climate is a function of safety policies and practices that are promoted within the organization. There are a number of safety climate scales that currently exist in the literature from which to choose. We chose the NIOSH safety climate in lieu of available alternatives because: (1) it broadly captures the content domain of safety climate; (2) a short version exists in the literature with related validly evidence; and (3) it includes items that target safety compliance and management practices that promote safety behavior.[23]

In conclusion, our results suggest that: (1) safety climate, violence prevention climate, and civility climate are distinct but related constructs that reflect different aspects of a broader climate of concern for the health and safety of employees from a variety of possible physical and nonphysical threats; and (2) all three of the climate domains are similarly predictive of most outcomes, regardless of domain specificity. Overall, these results might suggest that these three climate domains share a common higher order construct that may predict relevant workplace hazards better than any of the distinct scales alone.

Disclosure statement

No potential conflict of interest was reported by the authors.

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