Predictors and Outcomes of Workplace Violence and Aggression

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The authors developed and assessed the psychometric properties of an instrument measuring risk for workplace violence and expanded a model linking (a) risk and experience of violence and aggression from the public and (b) experience of aggression from coworkers to emotional well-being, psychosomatic well-being, affective commitment, and turnover intentions. Using data from 254 employees representing 71 different occupations, the measure demonstrated acceptable within-occupation and 1-month test–retest reliability. The data supported the model and showed that public-initiated violence and aggression and coworker-initiated aggression were differentially associated with personal and organizational outcomes.

Workplace violence is a critical health and safety issue facing North American organizations. Homicide, the most severe form of violence, is the second leading cause of death in American workplaces (Jenkins, 1996b). On average, 20 employees are murdered each week while at work or on duty (National Institute for Occupational Safety and Health [NIOSH], 1996). Although occupational homicide occurs more frequently in the United States, Canadian organizations are not immune to this phenomenon. For example, in 1999, a former employee of Ottawa–Carleton Transpo shot dead four transit workers and seriously wounded two others (Smith, 1999). Less severe forms of workplace violence (e.g., pushing) appear to be even more widespread. In the United States alone, approximately 18,000 individuals are assaulted on the job each week (NIOSH, 1996).

Despite the frequency and severity of workplace violence, little empirical research has examined its predictors and consequences (Barling, 1996). The purpose of this study is to address this limitation. First, we developed and evaluated the psychometric properties of a measure designed to assess risk of occupational violence on the basis of respondents' job characteristics. Second, we expanded a model developed by Rogers and Kelloway (1997; see also Schat & Kelloway, 2000) of the consequences of workplace violence and aggression by (a) incorporating risk of work-

place violence, (b) differentiating between coworker- and public-initiated violence and aggression, (c) distinguishing between likelihood of future violence and fear of future violence, and (d) examining the relationship between emotional well-being and affective commitment to the organization. We then evaluated the expanded model and compared it with a series of plausible alternative models of the consequences of workplace violence.

Workplace Violence and Aggression: Definition and Sources

In the current study, we measured both workplace violence and workplace aggression. Consistent with Jenkins (1996a), our definition of violence included physical assaults and threats of assault directed toward employees. Our decision to also measure nonphysical aggression (e.g., yelling, swearing) was based on two considerations. First, nonphysical aggression occurs in workplaces more frequently than does physical violence (Greenberg & Barling, 1999). Second, research on family violence suggests that nonphysical aggression often precedes physical violence (Murphy & O'Leary, 1989).

Workplace violence has been categorized into three major types on the basis of the assailant's relationship to the workplace (California Occupational Safety and Health Administration [Cal/ OSHA], 1995; see also Braverman, 1999). In the first type, the perpetrator of the violence has no legitimate business relationship with the targeted workplace and enters the work environment to commit a criminal act (e.g., robbery). Individuals at particular risk include taxicab drivers, convenience store employees, and gas station attendants. In the second type, the perpetrator, usually the recipient of an object or service provided by the target workplace, commits an act of violence, usually assault. Health care providers (e.g., nurses) and social service employees (e.g., social workers) are particularly vulnerable to this type of violence. In the third type, the offender is an employee or former employee of the workplace. Typically, a disgruntled employee threatens a coworker or supervisor for what is perceived as unfair treatment. Although the latter captures the majority of media attention, only 4–7% of workplace homicides occur between coworkers (Braverman, 1999). To date, no evidence exists to suggest that there are

differences between occupations in likelihood of coworker violence.

Although Cal/OSHA (1995) suggested that there are three major sources of workplace violence (i.e., criminals, clients, coworkers), operationally, it may be difficult to distinguish between criminals and clients as sources of workplace violence because criminals often pose as clients to gain entry into the organization. Therefore, for the purposes of the current study, we have differentiated between only two sources of violence and aggression: coworker initiated and public initiated.

Predictors of Workplace Violence

To date, there is a paucity of studies examining the correlates or predictors of workplace violence. Those that have looked at predictors have focused on either (a) describing the perpetrator of coworker violence or (b) identifying the job characteristics that increase the risk for violence from the public and coworkers. Research focused on the former is limited because it is descriptive rather than predictive (Barling, 1996; Braverman, 1999). And, as the vast majority of occupational violence involves robberies and other crimes (Toscano & Weber, 1995), a focus on developing a profile of violence-prone employees may be misguided given that coworkers are not the only, nor are they the predominant, source of workplace violence. Instead, it may be more appropriate to focus on identifying job characteristics that increase the risk for violence.

The first purpose of the current study is to develop an instrument to measure risk for workplace violence on the basis of job characteristics. To accomplish this task, we conducted a review of the workplace violence literature with the goal of identifying job characteristics that may potentially increase employee risk for violence (see the Appendix for a list of the job characteristics). Although there are exceptions (e.g., interacting with individuals under the influence of alcohol; Greenberg & Barling, 1999), the vast majority of the characteristics we identified are suspected of increasing the risk for violence from the public (e.g., denying the public a service or request; Hearnden, 1988). The lack of potentially high-risk job characteristics for coworker violence is not surprising, as there is no empirical evidence to suggest that there are differences between occupations in likelihood of coworker-initiated violence.

Development of a Measure

We developed a measure of risk for workplace violence (i.e., Risk for Violence Measure) using the job characteristics that we identified in our review (see previous section) as items. Following this, we conducted an item analysis and deleted those job characteristics that did not correlate with respondents' reported experience of violence. Finally, we assessed the reliability of the instrument using two strategies, noting that the nature of the scale content (i.e., items comprising a diverse array of occupational characteristics) made assessment of internal consistency inappropriate. First, on the basis of the intent of the measurement (i.e., to assess job characteristics), it was appropriate to conduct assessments of interrater reliability within occupations. Individuals holding similar occupations should identify similar job characteristics. If the measure is assessing job characteristics rather than individual characteristics, there should be substantial agreement across

individuals within occupations. Second, following a similar logic, the test–retest reliability of the measure should be high (i.e., given that occupational characteristics do not change rapidly, the measure should demonstrate substantial test–retest reliability).

Expanding a Model of Workplace Violence

The second purpose of the present study is to expand a model of the consequences of workplace violence. Rogers and Kelloway (1997) examined workplace violence within the traditional work stress framework (Pratt & Barling, 1988). Within this framework, there are three concepts of interest—stressor, stress, and strain. *Stressor* refers to an objective environmental characteristic or event, *stress* is the individual's subjective experience of the stressor, and *strain* refers to the individual's psychological and/or physiological response to the stress (Pratt & Barling, 1988). In Rogers and Kelloway's model, experience of workplace violence was the objective environmental event or stressor. The direct consequence of experiencing violence (i.e., the stress) was fear of future violence. Decreased emotional well-being, psychosomatic well-being, and affective commitment as well as increased intent to turnover were the strain reactions. Rogers and Kelloway (1997) demonstrated that fear of future violence mediates the relationship between experience of violence and personal (emotional well-being, psychosomatic well-being) and organizational (turnover intentions) outcomes. Fear of future violence did not predict affective commitment to the organization. Affective commitment predicted intent to turnover, and emotional well-being predicted psychosomatic well-being. Schat and Kelloway (2000) replicated the findings of Rogers and Kelloway using two samples, hospital staff and group home staff, suggesting that the model is generalizable across different work environments.

In the current study, we examine four extensions to Rogers and Kelloway's (1997) basic model. The expanded model is presented in Figure 1, with rationales for the modifications following. First, we incorporate occupational risk characteristics (i.e., Risk for Violence Measure) into the model. Incorporating risk characteristics into the model allows us to consider and empirically test three substantively different hypotheses about risk factors and actual experience: (a) We test the suggestion that job characteristics predict aggression and violence, which in turn predict personal and organizational outcomes (i.e., aggression and violence fully mediate the link between job characteristics and outcomes). (b) Second, we examine the possibility that job characteristics have been an unmeasured third variable in previous research in that job characteristics predict both violence/aggression and outcomes but that there is no link between the latter two constructs (i.e., a nonmediated model). (c) Finally, we test the suggestion that the link between job characteristics and outcomes is partially mediated, comprising both direct effects and indirect effects through violence and aggression.

Second, we distinguish between public- and coworker-initiated violence and aggression. Researchers have repeatedly called for more refined definitions of workplace violence and aggression (e.g., Barling, 1996). We refine our operationalization in two substantive ways. As mentioned above, we distinguish between physical violence and aggression. Previous research has confounded these two constructs by including them in one overall measure (e.g., Rogers & Kelloway, 1997; Schat & Kelloway,
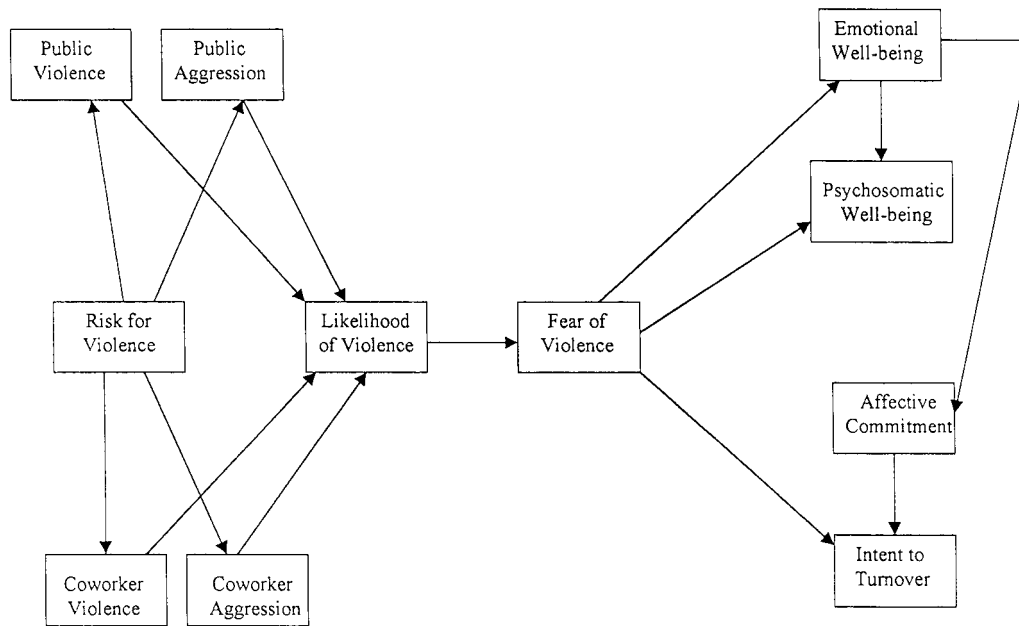
Figure 1. Expanded model of the effects of risk of workplace violence and aggression on personal and organizational outcomes.

2000). In addition, we consider the source of violence and aggression. In doing so, we are able to examine the potential for differential impacts of public- and coworker-initiated violence and aggression. Again, this distinction was not made in previous research.

Third, we differentiate between likelihood of future violence and fear of future violence. In the study by Rogers and Kelloway (1997), participants were asked a series of questions to determine whether they were afraid of experiencing workplace violence in the future (e.g., "I fear I will be hit, kicked, grabbed, shoved or pushed in the next year while I'm at work"). Participants could have misinterpreted the questions. They may have thought that they were being asked about their perceptions of likelihood of experiencing future violence rather than their actual fear of future violence. To address this concern, participants in the current study were asked whether they perceived a likelihood of experiencing future violent events and whether they were afraid of future violence. Extrapolating from findings of occupational safety studies (e.g., Rundmo, 1995; see also Cree & Kelloway, 1997), which have shown a positive relationship between injury experience and risk perception, we posited that experience of violence and aggression would predict perceptions of likelihood of experiencing future violence. Furthermore, perceptions of likelihood of experiencing violence were hypothesized to predict fear of future violence.

Fourth, we examined whether there was a direct relationship between employee emotional well-being and affective commitment to the organization. Recall that in Rogers and Kelloway (1997), fear of future violence did not predict affective commitment to the organization. In the current study, we examined whether the relationship between fear and affective commitment to the organization might be indirect. We hypothesized that emotional well-being might mediate the relationship between these two variables. This suggestion emerges from two observations. First, affective commitment to the organization has been identified as a

primary measure of mental health (Warr, 1987) and is plausibly related to indices of affective well-being. Second, empirically, Rogers and Kelloway (1997) did find support for a link between negative mood (i.e., a measure of affective well-being) and affective commitment.

The Current Study

Thus, the current study has two purposes. First, we developed and assessed the psychometric properties of an instrument measuring risk for workplace violence. Second, we expanded a model of the consequences of workplace violence (Rogers & Kelloway, 1997) and compared it with a series of plausible alternative models. In the expanded model we hypothesized that scores on the Risk for Violence Measure would predict experience of violence and aggression from both the public and coworkers. Experience of violence and aggression were posited to predict employee perceptions of likelihood of future violence, which in turn were hypothesized to predict fear of future violence. On the basis of previous research (Rogers & Kelloway, 1997), fear of future violence was posited to predict intent to turnover, psychosomatic well-being, and emotional well-being; the latter was posited to predict both psychosomatic well-being and affective commitment. On the basis of the findings of Rogers and Kelloway, affective commitment was posited to predict turnover intentions.

We compared the expanded model with a series of possible alternative models to answer the following two questions: First, we wanted to know whether the relationship between risk of violence and likelihood of violence was fully mediated by the experience of public- and coworker-initiated violence and aggression. To answer this query, we compared the expanded model, which is fully mediated, with both a partially mediated and a nonmediated model. The partially mediated model included a direct link be-

tween risk of violence and likelihood of violence as well as all the paths in the fully mediated model, whereas the nonmediated model contained only direct paths from risk to likelihood to all outcome variables. Second, we wanted to determine whether there are direct effects of coworker- and public-initiated violence and aggression on individual and organizational outcomes. To answer this question, we compared the model that provided the best fit to the data in Question 1 with three additional models. Model 1 included, in addition to indirect paths from experience of public and coworker violence and aggression to all personal and organizational outcomes, direct paths from coworker violence and aggression to the outcomes. Model 2 was identical to Model 1 except that the direct paths were from public violence and aggression to all outcomes rather than from coworker violence and aggression to the outcome variables. Finally, Model 3 included direct and indirect paths from experience of public and coworker violence and aggression to all outcome variables.

Method

Participants were employed in a range of occupations of varying risk for violence from the public. We distributed 500 questionnaires in a variety of settings (e.g., hospitals, factories) to attain a sample that was characterized by variability in experience of workplace violence and aggression. Two hundred sixty employees representing 71 different occupations returned their questionnaire, for a response rate of 52%. Although almost half of our questionnaires were not returned, a recent study conducted by Schalm and Kelloway (2001) suggests that response rate is unlikely to adversely affect the validity of survey findings. Six questionnaires were excluded from the analyses because of missing data, resulting in a final sample of 254 participants (149 women, 104 men, and 1 unreported). Participants ranged from 15 to 71 years of age ($M = 38.68$, $SD = 11.80$), and their level of education ranged from 7 to 28 years ($M = 16.12$, $SD = 3.41$). On average, participants had been employed at their present organization for 8.17 years ($SD = 7.48$), and their work week averaged 37.55 hours ($SD = 11.14$).

Materials

Each potential respondent was given a questionnaire package containing (a) a cover letter from us; (b) a demographic questionnaire that inquired about sex, date of birth, years of education, current occupation, length of work week, and tenure; (c) a stamped return envelope addressed to us; and (d) a questionnaire comprising the following eight measures.

Risk for violence was measured using 28 items designed to assess employee risk for workplace violence on the basis of job characteristics (e.g., "In your present employment how often are you in a position to deny the public a service or request?"). All items were rated using a 5-point scale, with responses ranging from 0 (*never*) to 4 (*always*). We determined participant scores by averaging across items, with higher scores reflecting greater risk for violence.

Violence at work was assessed with a 5-item scale that consisted of examples of physical violence (e.g., "Have you been hit, kicked, grabbed, shoved or pushed while you've been at work?"). The measure was a modified version of the 13-item scale used by Rogers and Kelloway (1997; see also Schat & Kelloway, 2000), who established the reliability and validity of the scale. Eight items were removed from the original scale because they were not consistent with our definition of violence (i.e., some items measured vicarious rather than actual experience of violence, whereas others measured aggression).

In the study conducted by Rogers and Kelloway (1997), participants were asked if they had ever experienced workplace violence, but they were not asked whether the perpetrator was a coworker or a member of

the public. However, in the current study, for each item respondents indicated separately the frequency of times they experienced violence from coworkers and the public. In other words, all items were rated on two 5-point scales (one scale measured frequency of violence from coworkers, and the other measured frequency of violence from the public), with responses ranging from 0 (*never*) to 4 (*four or more times*). The internal consistency for the scale measuring experience of violence from the public was acceptable ($\alpha = .90$), whereas the internal consistency for the scale measuring experience of violence from coworkers was weak ($\alpha = .17$). Because there was such a low level of coworker violence ($M = 0.02$, $SD = 0.10$) and the internal consistency of the scale was problematic, we decided to exclude coworker violence from further analyses.

Aggression at work was assessed with a three-item scale that measured the frequency of aggressive events (e.g., "Have you been yelled at or shouted at while you've been at work?"). The three items were used by Barling, Rogers, and Kelloway (2001; see also Schat & Kelloway, 2000). Consistent with the Violence at Work Scale, all items were rated on two 5-point scales (one scale measured frequency of aggression from coworkers, and the other measured frequency of aggression from the public), with responses ranging from 0 (*never*) to 4 (*four or more times*). The internal consistency for the scales measuring public aggression ($\alpha = .91$) and coworker aggression ($\alpha = .82$) were acceptable.

Likelihood of future violence at work assessed participants' perceptions of likelihood of experiencing violence over the next year. The five items that made up this scale corresponded to the Violence at Work Scale (e.g., "It is likely that I will be hit, kicked, grabbed, shoved or pushed while I'm at work"). The items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The reliability of the scale was satisfactory ($\alpha = .95$).

Fear of future violent events at work was assessed using a five-item scale adapted from Rogers and Kelloway (1997), who demonstrated the reliability and validity of the scale. The items corresponded to the Violence at Work and the Likelihood of Experiencing Future Violence at Work Scales (e.g., "I'm afraid of being hit, kicked, grabbed, shoved, or pushed while I'm at work"). All items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores reflected greater fear of future violence. The scale demonstrated satisfactory internal reliability ($\alpha = .95$).

Emotional well-being was measured by the 12-item version of the General Health Questionnaire (GHQ; Banks et al., 1980). The GHQ is used to detect subclinical levels of psychiatric disturbance (e.g., depression) in the general population. The response scale ranged from 1 (*not at all*) to 7 (*all of the time*), with high scores indicating good emotional health over the past year. The scale demonstrated acceptable internal consistency ($\alpha = .88$) after 1 item was deleted because it detracted from reliability.

Physical well-being was measured by the modified version of Spence, Helmreich, and Pred's (1987) Health Scale. Following previous research (Schat & Kelloway, 2000), we calculated a single overall score as the mean of all 14 items. All items were rated on a 7-point scale with responses ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Higher scores indicated good physical health over the past year. Internal consistency was acceptable ($\alpha = .84$).

Affective commitment was assessed by Allen and Meyer's (1990) eight-item measure. Affective commitment refers to employee "emotional attachment to, identification with, and involvement in, the organization" (Allen & Meyer, 1990, p. 1). The response scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores reflecting greater affective commitment to the organization. The scale demonstrated acceptable internal consistency ($\alpha = .82$).

Intention to turnover was assessed by the three-item measure developed by Cammann, Fichman, Jenkins, and Klesh (1979). Each item was rated on a 7-point scale with responses ranging from 1 (*strongly disagree*) to 7

(*strongly agree*), with higher scores reflecting fewer turnover intentions. The internal reliability of this scale was acceptable ($\alpha = .70$).

Procedure

Manon Mireille LeBlanc distributed questionnaires in a variety of work settings (e.g., convenience stores, elementary schools) to sample occupations at low, medium, and high risk for violence from the public. As previously stated, no evidence exists to suggest that there are differences between occupations in likelihood of coworker violence. Before beginning data collection, Manon Mireille LeBlanc conducted a review of the workplace violence literature to determine which occupations are considered high, medium, and low risk for violence. On the basis of this research, she produced a list of occupations to target. She then approached organizations that employ individuals in these occupations. When she arrived at an organization, she solicited permission from management to distribute the questionnaires to employees. Of the 58 organizations that were contacted, 6 declined the request. In total, 500 employees from 52 organizations agreed to complete a survey. The potential respondents were given a manila envelope that contained the survey and a two-page cover letter. The latter informed potential participants that the purpose of the study was to better understand the phenomenon of workplace violence; it also informed them that their participation was completely voluntary and that their responses were anonymous and confidential. Finally, participants were instructed to mail the completed questionnaire in the return envelope provided.

One month after data collection was completed, Manon Mireille Le-Blanc went to 15 of the original organizations and asked a total of 50 employees if they would once again complete the Risk for Violence Measure and the demographic questionnaire. All participants agreed. Thirty-six of the questionnaires were returned, for a 72% response rate. To ensure participant anonymity, we matched the first and second administrations of the scale on the basis of responses to the demographic questionnaire.

Results

Prior to conducting the analyses, we examined all univariate and multivariate assumptions. Linearity, homoskedasticity, multicollinearity, and normality were all found to be satisfactory, and no multivariate outliers were detected. However, three univariate outliers were found. All of the analyses were conducted with and without these outliers. Because including the outliers did not change the results of the analyses, all results are reported with the outliers present. Table 1 contains the descriptive statistics and intercorrelations of all study variables.

Item Analysis

We conducted an item analysis on the 28-item Risk for Violence Measure. Job characteristics that did not correlate with participants' reported experience of violence from the public were deleted ($N = 6$). Table 2 contains the list of remaining items and their correlations with public violence.

Reliability

To determine test–retest reliability, we asked 36 employees representing 22 occupations to complete the Risk for Violence Measure twice, with Time 1 and Time 2 separated by 1 month. Test–retest reliability was significant, $r(34) = .92$, $p < .01$.

We calculated within-occupation agreement of the job relevance of the items in the Risk for Violence Measure using James, Demaree, and Wolf's (1984) index. A minimum of 5 participants had to be employed in an occupation for the occupation to be included in the reliability calculation. This criterion was met for 13 occupations. Agreement ranged from .89 to .97. Table 3 contains the list of occupations, their reliability ratings, and their mean scores on the Risk for Violence Measure, Violence at Work Scale, and Aggression at Work Scale.

Path Analyses

The models tested were based on the covariance matrix and estimated using maximum likelihood estimation, as implemented in LISREL 8.3 (Jöreskog & Sörbom, 1993). Each model had one exogenous variable, risk, and nine endogenous variables, public violence, public aggression, coworker aggression, likelihood of future violence, fear of future violence, emotional well-being, psychosomatic well-being, affective commitment, and intent to turnover. In addition to the substantive paths described earlier, all models allowed residual covariances between the measures of aggression and violence. Table 4 presents the fit indices for the models under consideration.

To answer our first question, we compared the expanded model (i.e., fully mediated model) with both a partially mediated and a nonmediated model. The expanded model and the

Table 1
Descriptive Statistics and Intercorrelations of Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Risk for violence	1.12	0.57	—									
2. Violence from the public	0.41	0.82	.57**	—								
3. Aggression from the public	1.34	1.44	.59**	.63**	—							
4. Aggression from coworkers	0.73	1.09	.18**	.05	.33**	—						
5. Likelihood of future violence	2.12	1.61	.62**	.74**	.64**	.14*	—					
6. Fear of future violence	1.97	1.46	.43**	.53**	.48**	.11	.70**	—				
7. Emotional well-being	5.43	0.97	−.05	−.08	−.20**	−.32**	−.12	−.12	—			
8. Psychosomatic well-being	5.27	0.90	−.16*	−.14*	−.26**	−.39**	−.20**	−.18**	.61**	—		
9. Affective commitment	4.41	1.30	.03	−.01	−.04	−.24**	−.03	−.01	.37**	.26**	—	
10. Turnover	2.86	1.71	−.05	−.06	.07	.20**	.00	.02	−.20**	−.22**	−.49**	—

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

Table 2

Correlations of Items in the Risk for Violence Scale and Participant Reports of Public Violence

Item	Public violence
1. Physical care of others	.33**
2. Emotional care of others	.22**
3. Deny the public a service or request	.15*
4. Decisions that influence other people's lives	.32**
5. Work alone during the day	.22**
6. Work alone during the evening/night	.17*
7. Dispense drugs	.14*
8. Handle valuables	.15*
9. Guard valuables	.22**
10. Handle guns	.40**
11. Exercise security functions	.35**
12. Exercise physical control over others	.57**
13. Supervise others	.19**
14. Interact with frustrated individuals	.28**
15. Discipline others	.30**
16. Collect items of value	.14*
17. Work evenings/nights	.14*
18. Go to clients' home	.26**
19. Handle weapons other than guns	.44**
20. Contact with individuals under the influence of alcohol	.19**
21. Contact with individuals under the influence of illegal drugs	.24**
22. Contact with individuals taking medication	.40**

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

partially mediated model provided an adequate but not outstanding fit to the data, whereas the nonmediated model provided a poor fit. However, the partially mediated model offered an improvement in fit over the models hypothesizing both full mediation, $\Delta\chi^2(1, N = 249) = 19.56, p < .001$, and nonmediation, $\Delta\chi^2(2, N = 249) = 121.74, p < .001$. Because the partially mediated model provided the best fit, it was used for further model comparisons.

To answer our second question, we compared the partially mediated model with three plausible alternative models. When Model 1, which included all paths in the partially mediated model as well as direct links from coworker aggression to all five outcome variables (i.e., fear, emotional well-being, psychosomatic well-being, affective commitment, and intent to turnover), was compared with the partially mediated model, it provided a significantly better fit to the data, $\Delta\chi^2(5, N = 249) = 47.91, p < .001$. Model 2, which included all paths in the partially mediated model as well as direct links from public violence and aggression to all five outcome variables, did not provide an improvement over the partially mediated model, $\Delta\chi^2(10, N = 249) = 18.79, p > .05$. Model 3 was compared with the partially mediated model, and it was found to be a significantly better fit to the data, $\Delta\chi^2(15, N = 249) = 57.27, p < .001$. Model 3 contained paths identical to the partially mediated model as well as direct paths from coworker- and public-initiated aggression and public-initiated violence to all five outcome variables. Lastly, Model 1 and Model 3 were compared and found not to be significantly different from each other, $\Delta\chi^2(5, N = 249) = 9.36, p > .05$. Model 1 was, however, more parsimonious than Model 3; of the 10 additional paths in

Model 3 (public-initiated violence to the five outcome variables and public-initiated aggression to the same outcome variables), only one was statistically significant. Figure 2 and Figure 3 present the standardized parameter estimates for Model 1 and Model 3, respectively.[1]

Discussion

The aim of the current study is to (a) develop and assess the psychometric properties of an instrument measuring risk for workplace violence on the basis of job characteristics and (b) expand a model of the consequences of violence and aggression on personal and organizational outcomes and compare it with a series of plausible alternative models.

Examination of the psychometric properties of the Risk for Violence Measure reveals high within-occupation interrater agreement about the job relevance of the items. In other words, employees in identical occupations rated the characteristics of their job in a like manner, suggesting that the measure is assessing job characteristics rather than individual characteristics. Significant and substantial test–retest reliability was also established over a 1-month interval, providing further evidence of the reliability of the instrument. Overall, the results suggest that the measure could be reliably used by organizations to predict risk for workplace violence and aggression across a range of occupations.

As originally hypothesized, the Risk for Violence Measure significantly predicted experience of violence from the public as well as experience of aggression from both coworkers and the public. This finding suggests that high-risk-for-violence job characteristics, in addition to being predictive of violence, are also predictive of aggression. The Risk for Violence Measure also predicted perceived likelihood of future violence, suggesting that employees use both actual experience and job characteristics in estimating their own risk. Both public-initiated violence and public-initiated aggression predicted perceptions of likelihood of future violence, which in turn predicted fear of future violence. It appears, therefore, that it is not only victims of public-initiated violence who anticipate and fear violence but also victims of public-initiated aggression. On the contrary, coworker-initiated aggression did not predict perceptions of likelihood of future violence. It is possible that victims of public-initiated violence and aggression anticipate future violence because they view experiencing violence as a function of their occupation. Our finding that employees use job characteristics in estimating their own risk is consistent with this hypothesis. Coworker-initiated aggression is not associated with any particular occupation, and, therefore, victims may view the incident as an aberration that is unlikely to recur.

Contrary to our original hypothesis and findings from previous research (e.g., Rogers & Kelloway, 1997), fear did not negatively predict emotional well-being and psychosomatic well-being, nor did it positively predict turnover intentions. These null findings are most properly interpreted as a refinement rather than a disconfirmation of the Rogers and Kelloway (1997) model. In the current study, we differentiate between coworker- and public-initiated aggression, and we distinguish between violence and aggression.

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[1] Nonsignificant paths have been omitted from the models.

Table 3

Sample Size, Interrater Reliability, and Mean Scores for Risk for Violence, Public Violence and Aggression, and Coworker Aggression for 13 Occupations

Occupation	*N*	Reliability	Risk	Public violence	Public aggression	Coworker aggression
Nurse	13	.94	1.73	1.40	2.41	0.28
Orderly	5	.93	1.15	0.72	2.00	1.53
Secretary	19	.90	0.65	0.09	0.88	0.56
Factory worker	8	.89	0.62	0.00	0.00	1.75
Police officer	14	.93	2.39	1.81	3.29	0.93
Teacher	13	.94	1.23	0.58	1.82	0.54
Professor	5	.90	1.06	0.08	1.40	1.07
Psychologist	9	.96	1.04	0.38	1.19	0.19
Manager	20	.93	1.01	0.01	0.95	0.78
Counselor	5	.92	1.15	0.08	0.67	0.27
Security guard	7	.90	1.63	0.66	2.43	0.95
Research assistant	6	.94	0.61	0.00	0.00	0.17
Bartender	5	.97	0.89	0.08	1.20	0.47

Rogers and Kelloway did not make these distinctions, nor did later researchers (e.g., Schat & Kelloway, 2000). One result of making this distinction is that we found support for a direct link between public-initiated violence and turnover intent. Coworker-initiated aggression had direct effects on personal (emotional well-being, psychosomatic well-being) and organizational (affective commitment) outcomes but no effects on fear of future violence or intent to turnover. These results extend those of previous research (e.g., Rogers & Kelloway, 1997; Schat & Kelloway, 2000).

Before discussing the implication of these results for future research and practice, it is important to note several potential limitations of this study. First, the same individuals provided the self-report data for the independent and dependent variables, which increases the possibility of monomethod bias. The main concern with monomethod bias is that it may inflate the relationships of interest. An examination of the correlation matrix shows that several nonsignificant zero-order correlations exist between a number of the study variables, which suggests that it is less likely that monomethod bias is operating in this study. Future research could do more to address this issue. Rather than rely on self-reports of experience of violence and aggression, researchers could draw

this information from organizations. However, because there is considerable underreporting of violence in the workplace (Painter, 1987; Tutt, 1989), statistics collected in this manner may be misleading. Future studies could also rely on objective organizational measures (e.g., tardiness) as outcome variables. This method of information gathering can be problematic, however, because organizations and employees may be reluctant to allow investigators access to employee records (e.g., Johns, 1994).

The second potential limitation of the present study is its cross-sectional nature. Data on participant well-being, organizational attitudes, and experience of workplace violence and aggression were collected concurrently, which makes it impossible to determine with certainty the causal sequence of the variables. Although Model 1 and Model 3 provided an excellent fit to the data, it is plausible that other models would provide an equally satisfactory fit to the data. For example, an alternative model suggesting that fear of future violence would predict perceptions of likelihood of violence would result in a model equivalent to the ones we are proposing. As well, a model hypothesizing that the experience of violence and aggression makes employees more sensitive to risk factors would also be equivalent. Only with a longitudinal research

Table 4

Fit Indices for Models

Model	χ^2 (*N* = 249)	*df*	CFI	GFI	AGFI	NFI	NNFI	PNFI	RMSEA
Research Question 1									
Expanded model	84.88***	29	.94	.94	.88	.92	0.91	.59	.09
Nonmediated model	187.06***	31	.84	.89	.80	.81	0.76	.56	.14
Partially mediated model	65.32***	28	.96	.95	.91	.93	0.94	.58	.07
Research Question 2									
Partially mediated model	65.32***	28	.96	.95	.91	.93	0.94	.58	.07
Model 1	17.41	23	1.00	.99	.97	.98	1.01	.50	.00
Model 2	46.53***	18	.97	.97	.89	.95	0.93	.38	.08
Model 3	8.05	13	1.00	.99	.97	.99	1.02	.29	.00

Note. CFI = comparative fit index; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; NFI = normed fit index; NNFI = nonnormed fit index; PNFI = parsimony normed fit index; RMSEA = root-mean-square error of approximation.
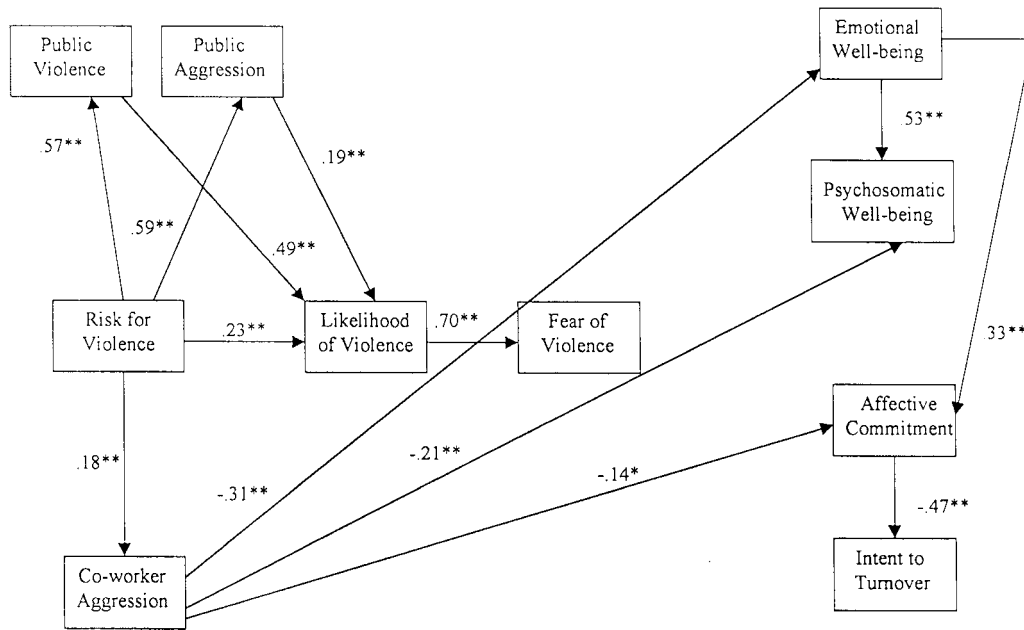*** $p < .001$.

Figure 2. Standardized parameter estimates for Model 1. *p < .05. **p < .01.

design will investigators be able to determine with confidence the predictors and outcomes of workplace violence.

Third, we note that in developing our Risk for Violence Measure, we relied on empirical associations between the items and measures of violence. Although it is empirically supportable, our measure does not have a compelling theoretical orientation, nor does it result in the identification of dimensions of jobs that may lead to increased risk of workplace violence and aggression. Our results do suggest that it is useful to consider these characteristics of occupations, and we suggest that more theoretically based scale development is a fruitful direction for future research.

The results of the current study have implications for future research and practice. First, our findings suggest that it is possible to measure employee risk for violence and aggression on the basis of job characteristics. Researchers could continue to identify risk characteristics for both public- and coworker-initiated violence
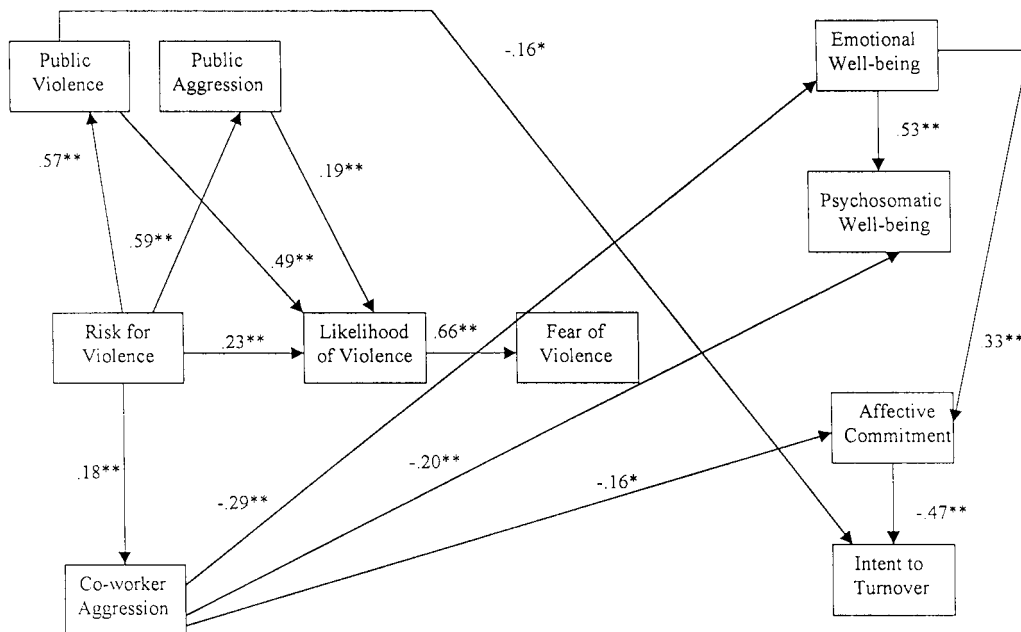

Figure 3. Standardized parameter estimates for Model 3. *p < .05. **p < .01.

and aggression. In addition, they could develop and assess prevention strategies on the basis of identified high-risk job characteristics. Organizations could use these data to both identify individuals at risk and modify working conditions to decrease risk.

Future research could investigate the reasons why public-initiated violence and aggression and coworker-initiated aggression are differentially associated with outcomes. Recall that coworker-initiated aggression negatively predicted affective commitment to the organization, whereas public-initiated violence and aggression did not predict this outcome. One possible reason for this difference is that victims of coworker-initiated aggression may believe that their organization can prevent the occurrence of coworker aggression, either through their selection process (i.e., not hiring individuals capable of aggression) or by promoting a culture with a zero tolerance for aggression. When these individuals do experience aggression from coworkers, they may attribute responsibility to the organization, which could lead to a decrease in affective commitment. Victims of public-initiated violence or aggression, on the other hand, may view the incident as part of the job and, as a result, may not hold the organization responsible. As you may recall, coworker-initiated aggression also negatively predicted both emotional and psychosomatic well-being. Perhaps employees who experience aggression from their coworkers must continue to have contact with their aggressors, which could impact their well-being. In contrast, victims of public-initiated violence and aggression may no longer have to interact with their aggressors, although there are certainly exceptions. It is up to future researchers to examine these hypotheses.

Investigators could also examine whether organizational responses to coworker-initiated aggression (e.g., terminate the offending employee) might moderate the relationship between experience of aggression and the negative outcomes that we identified in our study. It is likely that employees who work for an organization that chooses to ignore coworker-on-coworker aggression experience different outcomes than do individuals who are employed at a company that deals with aggression swiftly and appropriately. It is up to future investigators to answer these questions.

Summary and Conclusion

In summary, the psychometric properties of an instrument developed to measure risk of workplace violence on the basis of job characteristics were assessed. The measure demonstrated substantial within-occupation and 1-month test–retest reliability. As well, a series of models examining the link between risk of workplace violence and aggression and organizational and personal outcomes were compared. The results indicate that coworker-initiated aggression and public-initiated aggression and violence were differentially associated with outcomes. Coworker-initiated aggression negatively affected emotional well-being, psychosomatic well-being, and affective commitment. Public-initiated violence and aggression predicted perceptions of likelihood of future violence, which in turn predicted fear of future violence. Public-initiated violence also directly predicted employee intent to turnover. Given the increasing frequency of violence in today's organizations, researchers are encouraged to continue to investigate this phenomenon.

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Appendix

Job Characteristics Identified as Potentially Increasing Employee Risk for Violence

1. Physical care of others
2. Emotional care of others
3. Interact with the public
4. Deny the public a service or request
5. Decisions that influence other people's lives
6. Work alone during the day
7. Work alone during the evening/night
8. Oversee or administer other people's money
9. Dispense drugs
10. Handle valuables
11. Exchange money with the public
12. Guard valuables
13. Handle guns
14. Sell alcohol
15. Serve alcohol
16. Exercise security functions
17. Exercise physical control over others
18. Supervise others
19. Interact with frustrated individuals
20. Discipline others
21. Deliver items of value
22. Collect items of value
23. Work nights or evenings
24. Go to clients' homes
25. Handle weapons other than guns
26. Contact with individuals under the influence of alcohol
27. Contact with individuals under the influence of illegal drugs
28. Contact with individuals under the influence of medication

Note. Job characteristics were identified from the following sources: Barling, Rogers, and Kelloway (2001); Bensimon (1994); Castillo and Jenkins (1994); Canadian Centre for Occupational Health and Safety (1999); Cox and Leather (1994); Davis (1987); Engel (1987); Greenberg and Barling (1999); Guterman, Jayaratne, and Bargal (1996); Health Services Advisory Committee (1987); Hearnden (1988); International Labour Organization (1998); Kraus (1987); Lanza (1983); National Institute for Occupational Safety and Health (1996); Nova Scotia Department of Labour (1998); Poster and Ryan (1994); Tryon (1986); Tutt (1989).