



Work & Stress

An International Journal of Work, Health & Organisations

ISSN: 0267-8373 (Print) 1464-5335 (Online) Journal homepage: <https://www.tandfonline.com/loi/twst20>

When antecedent becomes consequent: An examination of the temporal order of job dissatisfaction and verbal aggression exposure in a longitudinal study

Stephanie A. Andel, Shani Pindek & Paul E. Spector

To cite this article: Stephanie A. Andel, Shani Pindek & Paul E. Spector (2019) When antecedent becomes consequent: An examination of the temporal order of job dissatisfaction and verbal aggression exposure in a longitudinal study, *Work & Stress*, 33:4, 334-350, DOI: [10.1080/02678373.2018.1509245](https://doi.org/10.1080/02678373.2018.1509245)

To link to this article: <https://doi.org/10.1080/02678373.2018.1509245>



Published online: 13 Aug 2018.



Submit your article to this journal [↗](#)



Article views: 454



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)



When antecedent becomes consequent: An examination of the temporal order of job dissatisfaction and verbal aggression exposure in a longitudinal study

Stephanie A. Andel ^a, Shani Pindek^b and Paul E. Spector^c

^aDepartment of Information Systems and Decision Sciences, Muma College of Business, The University of South Florida, Tampa, FL, USA; ^bDepartment of Human Services, The University of Haifa, Haifa, Israel;

^cDepartment of Psychology, The University of South Florida, Tampa, FL, USA

ABSTRACT

Past research has traditionally examined stressors as predictors and strains as outcomes. However, some recent research has found evidence of reverse causality between various stressors and strains, demonstrating that the relationship between these types of variables may extend beyond the traditional stressor-strain framework. The current study builds upon this past research by examining the temporal direction of the relationship between verbal aggression exposure and job satisfaction. Specifically, through the lens of emotional contagion theory, we suggest that low levels of job satisfaction in employees are detectable by others, which in turn leads them to engage in verbal aggression directed toward those employees. To test this postulation, 309 emergency medical professionals completed surveys that assessed verbal aggression exposure and job satisfaction across three time points. Results of cross-lagged structural equation model tests showed a significant job satisfaction to verbal aggression path over time, but a nonsignificant verbal aggression to job satisfaction path over time. Additionally, results support the postulation that job satisfaction leads to physical strain outcomes through verbal aggression exposure. Overall, results suggest that job satisfaction may serve as a predictor of verbal aggression exposure rather than a result within high stakes environments such as the emergency medical services.

ARTICLE HISTORY

Received 8 January 2017

Accepted 28 July 2018

KEYWORDS

Job satisfaction; aggression; emotional contagion; emergency services personnel

Traditional stressor-strain theories, such as the transactional model of stress (Lazarus & Folkman, 1984), the job demand-control model (Karasek, 1979), and the job demand-resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) adopt an Environment to Perception to Outcome (EPO) framework in which strains (including job dissatisfaction) are the consequent of environmental exposures to stressors, filtered through perceptions and appraisal of those stressors. One important class of stressors has to do with the social environment (Dormann & Zapf, 1999), and includes exposure to verbal aggression by others. The correlation of verbal aggression exposure to various strain outcomes has been well established (e.g. Hershcovis & Barling, 2010). However, many studies

linking verbal aggression to outcomes do not address the issue of temporal precedence. Such studies are cited in support of EPO-based models, but directionality is generally assumed rather than tested. Thus, our purpose is to provide such a test by utilising a three-wave cross-lagged design to assess over time if verbal aggression exposure is more likely the antecedent or consequent of job dissatisfaction.

It is imperative to examine potential predictors of verbal aggression in order to better understand how workplace aggression exposure may be alleviated and ultimately prevented. We believe job satisfaction is an important predictor variable to consider, especially as it has recently been shown to be an antecedent, and not just a consequence, in studies of customer responses to customer service employees (e.g. Zablah, Carlson, Donovan, Maxham III, & Brown, 2016). Ultimately, by examining potential individual-level predictors of verbal aggression, such as job satisfaction, we will get a fuller understanding of possible ways that organisations can intervene in order to address high levels of aggression.

Main contributions of the current study

This paper contributes to existing research in three ways. First, as mentioned, we utilise a three-wave longitudinal design to investigate how strain may be an antecedent to a stressor by examining the potential of job satisfaction to serve as a *predictor* of verbal aggression exposure. Through the lens of emotional contagion theory (Hatfield, Cacioppo, & Rapson, 1994), we consider the possibility that low job satisfaction of employees will influence others (including patients and their family members), which will ultimately be reflected in instances of verbal aggression directed to those employees. By examining the cross-lagged relationship between job satisfaction and verbal aggression exposure, we respond to a call from Meier and Spector (2013) to provide “more complex models and theories that recognise the dynamic interplay between employees and their work environments” (p. 537). Ultimately, by incorporating a cross-lagged, longitudinal design that incorporates both predictors and outcomes in the same model, this study will allow us to acquire a more comprehensive understanding of the complex relationship that exists between stressors and strains (Liu, Mo, Song, & Wang, 2016). Aside from minimal research that examines demographics and stable individual differences (e.g. negative affect) as predictors of verbal aggression exposure (Aquino & Thau, 2009), research has not focused upon the full range of factors that lead some individuals to be more vulnerable to aggression exposure than others.

Second, we examine the distal implications of job satisfaction and verbal aggression exposure. In particular, we examine the effects of these predictors on two physical indicators of employee well-being, namely overall sleep quality and daytime exhaustion. To this end, we test a structural equation model in which job satisfaction leads to sleep quality and daytime exhaustion through exposure to verbal aggression.

Third, this study contributes to the occupational health literature by studying employees within the emergency medical services (EMS). EMS occupations, which include paramedics and emergency medical technicians, are particularly high-risk, and research has shown that EMS personnel are exposed to a great deal of stressors on the job (Alexander & Klein, 2001), including verbal aggression exposure. In fact, recent research by Gormley, Crowe, Bentley, and Levine (2016) found that in a sample of over 2500 EMS personnel,

67% experienced verbal aggression exposure over the prior year. Such a high base rate makes EMS professionals an ideal sample to consider when investigating antecedents to this stressor, as it increases the chance that there will be enough variance to be able to identify effects.

The issue of reverse stressor-strain temporal order

As previously noted, occupational health research often conceptualises verbal aggression exposure as a *predictor* of strain, and thus it has not often been considered as an outcome (e.g. Hershcovis & Barling, 2010). Another variable of interest within this literature is that of job satisfaction, which may be defined as, “an evaluative state that expresses contentment with and positive feelings about one’s job” (Judge & Kammeyer-Mueller, 2012, p. 343). Up to this point, job satisfaction has also traditionally been studied in one specific way, namely as one *outcome* of employee experiences on the job, especially when it comes to social stressors such as verbal aggression (Lapierre, Spector, & Leck, 2005). Thus, research typically interprets relationships between these variables from an EPO perspective. Far less attention has focused on examining job satisfaction as a *predictor* of stressors such as verbal aggression exposure.

However, there have been some recent findings that provide evidence to suggest that the relationship between stressors and strains may be more complex than originally assumed. For instance, some researchers have found evidence for bidirectional relationships (e.g. Lian, Ferris, Morrison, & Brown, 2014; Meier & Spector, 2013), some have found evidence for traditional stressor-strain relationships (e.g. Taylor, Bedeian, Cole, & Zhang, 2017), while others found evidence that strain in fact precede subsequent experiences of stressors, rather than the other way around (Lang, Bliese, Lang, & Adler, 2011; Meier & Spector, 2013). Further, Tang (2014) provided a systematic review of such studies that have investigated temporal precedence between stressors and strains, and demonstrated that overall the literature is mixed regarding the true order in which these variables impact one another. Therefore, the results of past studies suggest that there is a more complicated relationship between workplace stressors and strains than what is assumed by the traditional EPO models. The current study aims to build upon this research by investigating the potential for another strain variable, namely job dissatisfaction, to precede verbal aggression exposure, a workplace stressor.

Ultimately, we argue that it is important and necessary to examine these reverse directions in order to better understand the complex relationships between job satisfaction and verbal aggression exposure. By doing so, we may unveil potential reciprocal relationships between a prominent social stressor and strain, thus adding to our understanding of the complex relationships that exist between these variables (Liu et al., 2016).

Theoretical framework

Emotional contagion theory

Emotional contagion theory posits that emotions are contagious and thus have the capacity to flow from one person to another, leading to emotional convergence

(Hatfield et al., 1994). This contagion may occur unconsciously, in which individuals, “automatically mimic and synchronise facial expressions, vocalisation, postures and movements with those of another person and, consequently, to converge emotionally” (Hatfield et al., 1994, p. 5), or it may occur consciously, such as when individuals deliberately search for emotions as a source of social information (Hennig-Thurau, Groth, Paul, & Gremler, 2006). Organisational research has found support for this notion that emotional experiences are in fact contagious. For instance, within the service industry, employee emotions have been shown to have a significant impact on customer emotions (Pugh, 2001). Further, research has found evidence to suggest that such contagion goes beyond just emotions. Specifically, behaviours (e.g. antisocial behaviours; Robinson & O’Leary-Kelly, 1998), strains (e.g. burnout; Bakker, Le Blanc, & Schaufeli, 2005), and attitudes (e.g. job satisfaction; Zablah et al., 2016) have all been found to be contagious among individuals in the workplace.

Past research that has applied emotional contagion to job satisfaction has been conducted almost exclusively in the customer service literature. For instance, recent research by Zablah et al. (2016) found that employee satisfaction can be “caught” by customers to influence customer satisfaction, and vice versa. Similar results for a contagious effect of employee satisfaction on customer satisfaction have also been found in research by Homburg and Stock (2004) and by Wangenheim, Evanschitzky, and Wunderlich (2007). Meta-analytic evidence from Brown and Lam (2008) also supports this notion, finding that employee satisfaction can influence customer satisfaction, and that this relationship is partially mediated by service quality. This research suggests that job dissatisfaction leads employees to provide suboptimal service to their customers, which in turn triggers customer dissatisfaction.

We could only find one paper that examined the contagiousness of job satisfaction outside of the customer service literature, and this study found a similar link between job satisfaction and patient satisfaction in a sample of nurses (Tzeng, Ketefian, & Redman, 2002). The current paper aims to further extend emotional contagion theory in order to investigate the contagious role of job satisfaction in a sample of EMS professionals. Specifically, in line with the aforementioned past research, we argue that job satisfaction of employees, or at least the impact of that satisfaction on behaviour, may be detectable to others (e.g. patients, their family members, coworkers), and in turn may be contagious. This dissatisfaction may elicit negative behavioural strain from others, such as engaging in verbal aggression that is targeted toward the EMS professionals. This proposition is in line with the emotion-centered model of job stress (Spector, 1998), which posits that perceived stressors often elicit negative affective responses (e.g. anger, frustration).

Thus, in order to test the hypothesised contagion effect, we gathered a measure of verbal aggression exposure as an indication of others’ reaction to the apparent dissatisfaction of EMS professionals. This was most appropriate, as verbal aggression is a behavioural manifestation of the strain felt by these individuals (Spector, 1998). We hypothesise the following:

Hypothesis 1: Job satisfaction will be positively related to subsequent verbal aggression exposure.

Implications of the “job satisfaction – verbal aggression exposure” relationship

In addition to low job satisfaction leading to greater verbal aggression exposure on the job, we posit that there are additional negative implications of this process. Specifically, we suggest that the verbal aggression exposure that results from employee job dissatisfaction will serve as a workplace stressor for those employees, and this will ultimately lead to additional strain, in alignment with a traditional “stressor-strain” EPO framework (e.g. Lazarus & Folkman, 1984). In particular, we investigate the impact that job satisfaction and verbal aggression exposure have on two physical health outcomes, namely overall sleep quality and daytime exhaustion (i.e. difficulty staying awake during the day). By examining these outcomes, we are able to examine the degree to which the detrimental effects of verbal aggression exposure manifest themselves outside of the workplace, which has implications not only for individual well-being, but also for the ability of EMS professionals to remain alert in their high-stakes environment and provide optimal care for their patients (Patterson et al., 2012).

Past research has found verbal aggression exposure to be related to a multitude of negative strain outcomes. For instance, LeBlanc and Kelloway (2002) found both coworker-initiated aggression and outsider-initiated aggression to influence emotional and physical well-being. Further, Grandey, Kern, and Frone (2007) found both insider initiated (i.e. supervisor and coworker) and customer verbal aggression to lead to emotional exhaustion. Meta-analytic evidence also suggests the workplace aggression is associated with a variety of exhaustion-related strain outcomes, including sleep disturbances (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011) and emotional exhaustion (Hershcovis & Barling, 2010). We aim to replicate these findings within the EMS setting, such that verbal aggression exposure should be related to physical strain symptoms.

Hypothesis 2: Verbal aggression exposure will be positively related to subsequent (a) overall sleep quality and (b) daytime exhaustion.

Finally, building upon meta-analytic findings that showed job satisfaction is linked to a vast array of strain outcomes, including physical strain (Faragher, Cass, & Cooper, 2005), we suggest that verbal aggression exposure may serve as a mediating mechanism that accounts for the link between job satisfaction and strain. Specifically, verbal aggression exposure may serve to explain this relationship, as job (dis)satisfaction directly makes the job more stressful by instigating instances of verbal aggression exposure. This increased stress should in turn lead to strain, thus negatively impacting overall sleep quality and daytime exhaustion.

Hypothesis 3a: Verbal aggression exposure will mediate the relationship between EMS job satisfaction and overall sleep quality.

Hypothesis 3b: Verbal aggression exposure will mediate the relationship between EMS job satisfaction and daytime exhaustion.

Method

Participants in this study were recruited from a publicly available list of licensed EMS professionals on the Florida Department of Health website (www.floridahealth.gov). Specifically, 17,609 currently licensed EMS professionals were emailed an invitation to

participate. Although it is not possible to know how many individuals opened this email, the survey software showed that 1201 individuals opened the survey and thus had the opportunity to read the study consent form (the consent form was on the first page of the survey). Of these individuals, 335 completed the entire first survey, and 309 were currently serving as EMS professionals (a final response rate of 25.7%). Therefore, the sample size for the first wave of the study was 309 current EMS professionals.

These EMS professionals were surveyed three times, 5 weeks apart. A total of 309 current EMS professionals completed the initial (T_1) survey. Five weeks later, those who completed the first survey and indicated a willingness to be resurveyed were invited to complete an additional survey. One hundred and sixty-six EMS professionals completed this second (T_2) survey. Finally, 132 EMS professionals completed the third (T_3) survey that was sent to those who completed the second survey. Participants were not compensated for their participation in this study, and responses were anonymous. In order to keep responses anonymous, participants were directed to an external survey after completing the first and second study surveys in order to provide their email addresses for the subsequent surveys. This allowed for participant emails to be separate from their responses so that no one's data could be linked to them. Further, in order to link the survey responses across the three waves, participants were asked to answer three self-generated identification code questions that only they would know the answer to (e.g. What is your mother's birthday?), but would not reveal their identities (Kearney, Hopkins, Mauss, & Weisheit, 1984). This procedure allowed us to match the survey responses, while also maintaining the anonymity of the participant responses.

A nonresponse bias analysis was conducted in order to investigate whether the participants who stayed in the study versus those who dropped out (at any time) were significantly different from each other on the study variables at time 1. Results demonstrated that there were no significant mean differences between those who stayed in the study and those who dropped out at any point, thus providing further support for the robustness of the current study results.

Our T_1 sample consisted of 76.4% males, with an average age of 37.12; 78.0% were White, 12.3% were Hispanic, 2.3% were Black, 0.3% were Asian, and 7.1% were of another ethnicity. The average length of emergency service was 10.3 years, and 85.8% of the sample reported working at least 40 hours per week. These demographics generally reflect the national population of EMS professionals (The National Registry of EMTs, 2014; The National Registry of EMTs, 2015).

Measures

Verbal aggression exposure

Verbal aggression exposure was measured with 4 items from the Workplace Aggression Research Questionnaire (Neuman & Keashly, 2004). For the T_1 survey, participants were asked to indicate on a Likert scale the degree to which they had been exposed to verbal aggression behaviours over the past year (1 = "Not at all"; 5 = "Every day"). For the T_2 and T_3 surveys, participants were asked to indicate on a Likert scale the degree to which they had experienced verbal aggression over the past month (1 = "Not at all"; 4 = "Every day"). Participants were asked about exposure to behaviours such as "getting

yelled or sworn at” and “getting insulted or made fun of”. Reliability for this scale was acceptable across all three time points ($\alpha = .75, .78, .72$, respectively).

Job satisfaction

Job satisfaction was measured with a three-item subscale of the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). Participants indicated the degree to which they agreed with each of the items on a Likert scale (1 = “Strongly Disagree”; 5 = “Strongly Agree”). This scale was identical across the three time points. A sample item from this scale is “All in all, I am satisfied with my job”. Reliability for this scale was acceptable across all three time points ($\alpha = .86, .89, .88$, respectively). Due to an error in data collection, only 160 participants completed the job satisfaction measure at T₁.

Daytime exhaustion

Daytime exhaustion was measured at Time 2 and Time 3 with one item from the Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Specifically, participants responded to the following question: “How often have you had trouble staying awake while driving, eating meals, or engaging in social activity?” Responses were given on a Likert scale (1 = “None at all during the past week”; 4 = “Three or more times in the past week”). Past research has also used this single item as an indicator of daytime fatigue (e.g. Begg, Sullman, & Samaranayaka, 2012; Crain, Schonert-Reichl, & Roeser, 2017).

Overall sleep quality

Overall sleep quality was measured at Time 2 and Time 3 with another single item from the PSQI (Buysse et al., 1989). Participants responded to the following question: “During the past week, how would you rate your sleep quality overall?” Responses were given on a Likert scale (1 = “Very bad”; 4 = “Very good”).

Statistical analyses

The Mplus 7 programme (Muthén & Muthén, 1998–2012) was used to conduct confirmatory factor analyses and structural equation modeling analyses. In order to deal with non-normality and missing values, we utilised robust full-information maximum likelihood estimation (MLR), which makes use of all available individual observations by fitting models directly to raw data (Muthén & Muthén, 1998–2012). We assessed model fit with the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error of approximation (RMSEA), as recommended by Hu and Bentler (1999) and MacCallum and Austin (2000). Finally, to compare nested models, we calculated differences in fit according to Satorra and Bentler (2010).

Results

See Table 1 for descriptive statistics and correlations of the study variables. Note that verbal aggression exposure and job satisfaction were negatively related, both within and across the three study waves.

Table 1. Descriptive statistics and correlations.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Verbal Aggression (T ₁)	2.00	0.85	(.75)									
2. Verbal Aggression (T ₂)	1.59	0.58	.63 _e **	(.78)								
3. Verbal Aggression (T ₃)	1.56	0.59	.63 _c **	.75 _c **	(.72)							
4. Job Satisfaction (T ₁)	4.13	0.93	-.41 _d **	-.43 _b **	-.42 _a **	(.86)						
5. Job Satisfaction (T ₂)	4.10	0.86	-.35 _e **	-.29 _e **	-.23 _c **	.79 _b **	(.89)					
6. Job Satisfaction (T ₃)	4.07	0.92	-.33 _c **	-.28 _c **	-.27 _c **	.76 _a **	.74 _c **	(.88)				
7. Sleep Quality (T ₃)	2.62	0.76	-.27 _c **	-.35 _c **	-.33 _c **	.23 _a	.14 _c	.17 _c *	–			
8. Daytime Exhaustion (T ₃)	1.64	0.94	.31 _c **	.31 _c **	.28 _c **	-.27 _a *	-.23 _c **	-.29 _c **	-.55 _c **	–		
9. Age	37.12	12.30	-.31 _f **	-.28 _e **	-.27 _c **	.05 _d	.05 _e	.12 _c	.25 _c **	-.24 _c **	–	
10. Tenure (Years)	10.34	9.81	-.21 _f **	-.20 _e *	-.22 _c *	.02 _d *	-.01 _e	.09 _c	.14 _c	-.20 _c *	.70 _f **	–
11. Gender	1.24	0.43	.02 _f	.03 _e	.01 _c	-.10 _d	-.03 _e	-.09 _c	-.06 _c	.09 _c	-.11 _f	-.20 _f **

Note: _a*N* = 69, _b*N* = 89, _c*N* = 132, _d*N* = 159–160, _e*N* = 166, _f*N* = 308–309.

p* < .05; *p* < .01.

In the first step, we tested for measurement invariance across time for the latent variables job satisfaction and verbal aggression exposure (e.g. Finkel, 1995). Specifically, we compared a two-factor measurement model with freely-estimated factor loadings with a similar model that differed only in that the factor loadings were constrained to be equal across time. Only T_2 and T_3 were constrained to be equal, and T_1 was free to vary. This is because the verbal aggression exposure measure had a different time reference for T_1 (verbal aggression exposure in the past year) versus T_2 and T_3 (verbal aggression exposure in the past month). Metric invariance is supported if the constrained model does not fit significantly worse than the unconstrained model, as this suggests that the latent constructs have the same meaning across time (Schmitt & Kuljanin, 2008). Both the unconstrained model ($SB-\chi^2(153) = 232.70, p < .05, CFI = .95, TLI = .93, RMSEA [90\% CI] = .042 [.032, .053]$) and the constrained model ($SB-\chi^2(160) = 238.85, p < .05, CFI = .95, TLI = .94, RMSEA [90\% CI] = .040 [.029, .050]$) demonstrated good fit. Upon comparison, the models did not differ significantly ($\Delta SB-\chi^2(7) = 4.25, p = .75$), and thus we favored the more parsimonious constrained model. The longitudinal constraints on the factor loadings were retained in the subsequent analyses.

In the second step, we compared model fit for two structural cross-lagged models. In these models, a latent variable at Time 2 is predicted by the same variable at Time 1 (i.e. the autoregressor) and the other latent variable at Time 1. This design allows for control of the stability of measures over time, and thus provides indication of the effect of one variable on the other. In alignment with recommendations by Cole and Maxwell (2003), variance due to measurement occasion was accounted for by cross-sectionally correlating the disturbances of the corresponding factors. In the first model, all of the structural coefficients were freely estimated. In the second model, the structural parameters were constrained to be equal across both time intervals (with the exception of any paths that included the T_1 verbal aggression exposure variable, for reasons described above). Both the unconstrained model ($SB-\chi^2(164) = 251.95, p < .05, CFI = .95, TLI = .93, RMSEA [90\% CI] = .041 [.030, .051]$) and the constrained model ($SB-\chi^2(166) = 255.92, p < .05, CFI = .95, TLI = .93, RMSEA [90\% CI] = .041 [.030, .051]$) demonstrated good fit. Upon comparison, these models did not differ significantly in their fit ($\Delta SB-\chi^2(2) = 2.74, p = .25$). Thus, we favored the more parsimonious model and retained the longitudinal constraints on the structural coefficients.

Figure 1 includes all the standardised cross-lagged coefficients that were estimated in the final model with longitudinal constraints on structural coefficients and the stability coefficients (autoregressors) for both variables. Note that constraints across time were imposed upon unstandardised coefficients, leading to minor variation in the resulting standardised coefficients. Therefore, to reduce complexity, we report the mean of the standardised coefficients in the figure. The only exceptions are for the paths of verbal aggression predicting job satisfaction and subsequent verbal aggression, because these paths were not constrained to be equal due to differences in measurement of verbal aggression exposure at T_1 versus verbal aggression exposure at T_2 and T_3 . All unstandardised path estimates can be found in Table 2. Overall, regarding hypothesis 1, results show that job satisfaction was a significant predictor of verbal aggression exposure. Thus, hypothesis 1 was supported. Interestingly, verbal aggression exposure was not a significant predictor of job satisfaction in the model. All results remained consistent after adding demographic controls to the model (i.e. gender, age, tenure).

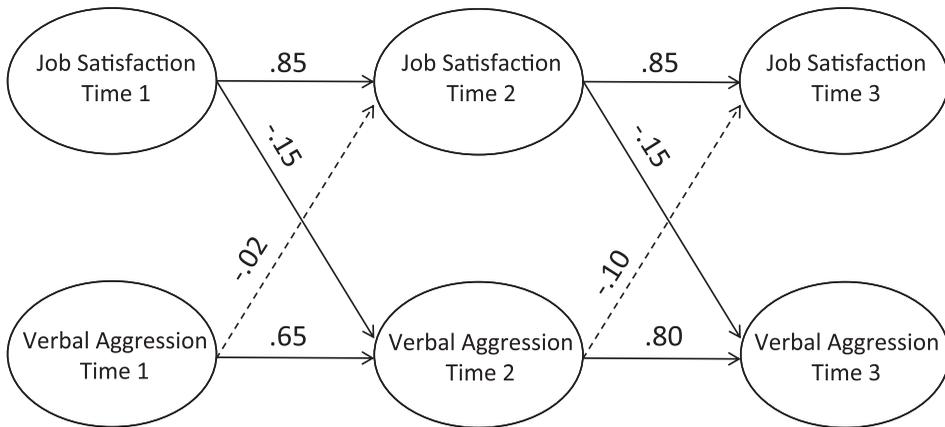


Figure 1. Structural model to test the reciprocal effect of verbal aggression exposure and job satisfaction.

Note: This figure excludes observed variables and within-wave correlations of residual variances. A solid/dashed line indicates a significant/nonsignificant path.

A follow-up analysis was conducted to investigate whether the job satisfaction → verbal aggression paths were significantly different from the verbal aggression → job satisfaction paths. To do this, we tested a model in which the job satisfaction → verbal aggression paths were constrained to be equal to the verbal aggression (T₂) → job satisfaction (T₃) path. The fit of this constrained model was not significantly different from the model in which these paths were not constrained to be equal ($\Delta\text{SB-}\chi^2(1) = .53, p > .05$). Therefore, we cannot say that one direction is significantly stronger than the other in the relationship between verbal aggression exposure and job satisfaction.

Next, we examined the impact of job satisfaction and verbal aggression on overall sleep quality and daytime exhaustion. To do this, we specified a structural equation model in which job satisfaction (T₁) predicted verbal aggression exposure (T₂), which ultimately predicted our two outcome variables (overall sleep quality and daytime exhaustion; T₃), which were allowed to covary. Further, the earlier measure for each variable was included as a predictor of that same variable (i.e. verbal aggression exposure, overall sleep quality,

Table 2. Path estimates for final cross-lagged model.

Specified path	Path estimate	Standard error
JS (T ₁) → VA (T ₂)	-0.16*	0.07
JS (T ₂) → VA (T ₃)	-0.16*	0.07
JS (T ₁) → JS (T ₂)	0.88**	0.06
JS (T ₂) → JS (T ₃)	0.88**	0.06
VA (T ₁) → JS (T ₂)	-0.01	0.05
VA (T ₂) → JS (T ₃)	-0.10	0.07
VA (T ₁) → VA (T ₂)	0.46**	0.07
VA (T ₂) → VA (T ₃)	0.79**	0.08
JS (T ₁) with VA (T ₁)	-0.39**	0.10
JS (T ₂) with VA (T ₂)	0.07	0.04
JS (T ₃) with VA (T ₃)	0.00	0.03

Note: $N = 309$; JS = Job satisfaction; VA = verbal aggression exposure; DE = daytime exhaustion; SQ = sleep quality.

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

Table 3. Path estimates for mediation model with daytime exhaustion and sleep quality.

Specified path	Path estimate	Standard error
JS (T ₁) → VA (T ₂)	-0.25*	0.12
VA (T ₂) → DE (T ₃)	0.27**	0.10
VA (T ₂) → SQ (T ₃)	-0.24**	0.07
VA (T ₁) → VA (T ₂)	0.47**	0.07
VA (T ₁) → DE (T ₂)	0.23**	0.08
VA (T ₁) → SQ (T ₂)	-0.18**	0.06
DE (T ₂) → DE (T ₃)	0.50**	0.09
SQ (T ₂) → SQ (T ₃)	0.54**	0.07
JS (T ₁) with VA (T ₁)	-0.40**	0.12
DE (T ₂) with SQ (T ₂)	-0.24**	0.07
DE (T ₃) with SQ (T ₃)	-0.17**	0.05

Note: N = 309; JS = Job satisfaction; VA = verbal aggression exposure; DE = daytime exhaustion; SQ = sleep quality.
*p < .05; **p < .01.

daytime exhaustion). This model showed adequate fit based on common criteria (SB- $\chi^2(83) = 166.50, p < .01, CFI = .93, TLI = .91, RMSEA [90\% CI] = .052 [.039, .065]$). All path coefficients were significant, such that job satisfaction (T₁) significantly predicted verbal aggression exposure (T₂), which ultimately predicted overall sleep quality (T₃) and daytime exhaustion (T₃). See Table 3 for the unstandardised estimates and Figure 2 for the model as a whole. Overall, hypothesis 2 was fully supported. These results remained consistent even after the inclusion of demographic controls (i.e. gender, age, and tenure).

Finally, in support of hypothesis 3, the indirect effect was also significant for sleep quality (effect = .060, CI₉₅ = .001, .164) and daytime exhaustion (effect = -.068, CI₉₅ = -.214, -.007).

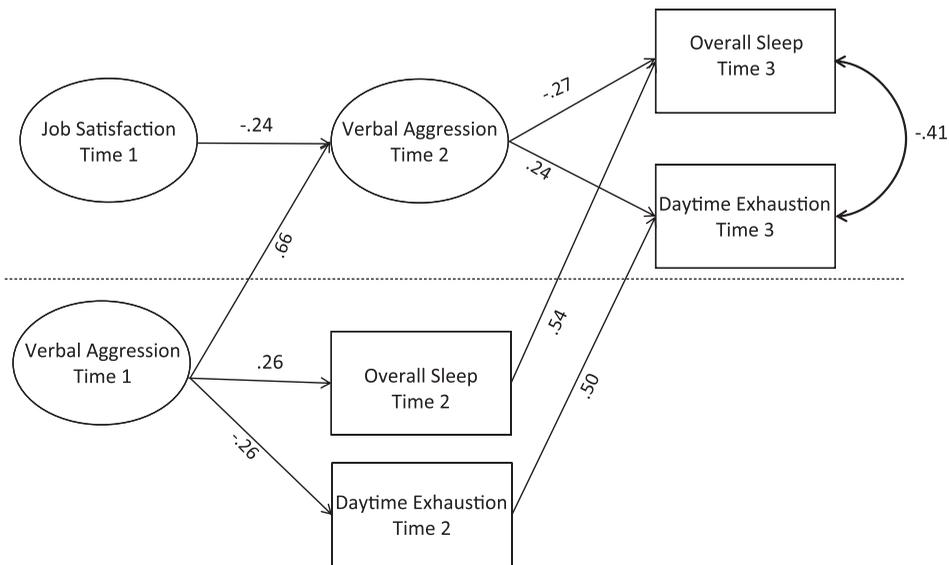


Figure 2. Results for the full theoretical model including overall sleep quality and daytime exhaustion as outcomes.

Note: Covariances between job satisfaction (T₁) and verbal aggression (T₁) and between overall sleep (T₂) and daytime exhaustion (T₂) were included in model testing but are not shown in the figure. All paths were significant.

Discussion

This study examined the relationship between job satisfaction and verbal aggression exposure across three time points, specifically investigating the temporal precedence between these two variables. Results of this study suggest that job satisfaction predicts subsequent verbal aggression exposure, thus adding to recent research that indicates the relationship between various workplace stressors and strains is more complex than what is inferred with the commonly used EPO framework. Further, this research examined distal implications of the job satisfaction-verbal aggression relationship. Results support the postulation that job satisfaction influences physical strain outcomes (i.e. daytime exhaustion and overall sleep quality) through workplace verbal aggression exposure.

Overall, results of this study demonstrate the importance of considering temporal precedence between stressors and strains in order to better understand the complex relationships between these variables. In this study, evidence suggests that job satisfaction precedes verbal aggression exposure, thus supporting the notion that employee job dissatisfaction may be “contagious” to others, which in turn leads these other individuals to engage in behavioural manifestations of dissatisfaction, such as verbal aggression aimed at the dissatisfied employee. This is particularly relevant in high-risk occupations such as the emergency medical services, because during emergency calls, stress levels are likely to be high, which may become exacerbated if individuals (particularly patients and family members) sense low levels of employee job satisfaction.

It is important to note that while the paths in which verbal aggression preceded job satisfaction were not significant in our autoregressive model, follow-up tests indicated that these paths was not significantly different from the paths in which job satisfaction preceded verbal aggression exposure. Ultimately, although we cannot say that either of these temporal directions is significantly stronger than the other, these results still provide important evidence to suggest that job satisfaction is in fact an antecedent of verbal aggression exposure. These results have important implications for researchers who desire to fully consider the impact of stressors and strains (and vice versa) within the workplace.

Additionally, this study suggested that job satisfaction levels may have distally impacted sleep-related physical health outcomes (i.e. overall sleep quality and daytime fatigue) through verbal aggression exposure. The physical strain outcomes examined in the current study are particularly important for high-risk occupations such as those within EMS, as they have implications for both employee health and performance (Patterson et al., 2012). Thus, this finding provides another reason that organisations, especially those of a high-risk nature, may wish to consider the importance of employee satisfaction levels.

This study has important theoretical implications for future research. First, this study extends the literature that examines temporal precedence between stressors and strains by investigating a social stressor (i.e. workplace aggression exposure). While a sizable number of studies have examined temporal precedence between strain and workload demands (for a review, see Tang, 2014), there is limited research that considers the important question of temporal precedence between strain and social stressors, such as workplace aggression exposure. On a related note, this study extends the literature by considering emotional contagion as a potential mechanism by which social stressors may lead to strain. Most

research thus far has considered reverse stressor-strain effects through the lens of the “drift hypothesis”, which posits that unhealthy employees are more likely to “drift” to unfavourable work environments (e.g. de Jonge et al., 2001), and the “perception hypothesis”, which posits that strained individuals tend to perceive their workplace more negatively (e.g. de Lange, Taris, Kompier, Houtman, & Bongers, 2005). While these are two plausible and important theories to consider when conceptualising reverse effects between a number of workplace stressors and strains, we believe emotional contagion provides another important mechanism by which strain may lead to stressors (particularly social stressors) on the job. We recommend that future researchers continue to consider contagion effects when investigating stressor-strain temporal precedence, especially when the stressor of interest is social in nature.

Regarding practical implications, results of this study suggest that interventions aimed at enhancing employee job satisfaction will not only positively impact job attitudes, but may also decrease levels of workplace aggression exposure. Such interventions might include efforts to increase employee satisfaction levels by fostering support levels among coworkers (Chiaburu & Harrison, 2008), or by training leaders to engage in more positive and supportive leadership behaviours (Judge, Piccolo, & Ilies, 2004).

Additionally, it is important to note that verbal aggression exposure can be debilitating for employees (Bowling & Beehr, 2006), and therefore it is imperative for organisations to also consider direct ways to address aggression exposure within the workplace. For instance, initiatives to enhance the civility climate (Ottinot, 2008) and to provide training in conflict resolution skills (Leon-Perez, Notelaers, & Leon-Rubio, 2016) may be warranted in organisations where employees are exposed to high levels of verbal aggression exposure.

Limitations and directions for future research

An initial limitation of this study is that the verbal aggression measure used does not differentiate between sources of verbal aggression. However, it should be noted that research has found that patients and family members are by far the most common perpetrators of verbal aggression toward EMS professionals (Bigham et al., 2014), and thus most instances of verbal aggression exposure reported in this study were most likely to come from patients and/or their family members. Regardless, future research should differentiate between these various sources in order to see if the temporal precedence of the relationship between verbal aggression exposure and job satisfaction changes depending on the source of verbal aggression.

A second limitation of this study lies in the fact that all variables were assessed with self-report surveys, which raises the concern for potential common method bias. However, it should be noted that this concern is mitigated by the fact that data was collected at three different time points (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), and that controlling for prior measures of the variables would likely account for any systematic method variance. Regardless, future research may wish to further examine these relationships by gathering data from multiple sources (e.g. patient satisfaction ratings; objective indicators of sleep quality).

A third limitation of this study is the fact that the retention rate between T_1 and T_2 was lower than desired (53.7%). This may be due to the fact that participants did not receive

any compensation for completing the survey studies, and thus incentive to continue in the study was low. Further, the T₂ data was collected during the December holiday season, which may have interfered with participants' ability to complete the T₂ survey at that time. Therefore, future research may wish to replicate this study with compensation in order to maintain higher retention rates across time points.

Finally, in order to fully address the theory presented in this paper, it would be ideal to gather direct measures of patient satisfaction. Specifically, it should be possible to devise a system in which patients and family members are given satisfaction surveys and asked to complete them. Then, satisfaction levels with EMS professionals could be linked with patient survey results to further test for contagion effects.

Conclusion

Overall, results of this research provide evidence that the relationship between job satisfaction and verbal aggression exposure extends beyond the commonly assumed EPO framework, such that employee job satisfaction levels may influence the amount of verbal aggression exposure that they experience on the job. Additionally, this research suggests that this sequence of events can ultimately have detrimental effects on employee well-being in the form of physical strain outcomes, namely overall sleep quality and daytime exhaustion. Ultimately, this study builds upon recent research to suggest that it may be beneficial for researchers to look beyond the EPO framework when considering the complex relationships between workplace stressors and strains, and to investigate the extent to which our assumed consequences might in fact be antecedents.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the National Institute for Occupational Safety and Health [grant number T42-OH008438].

ORCID

Stephanie A. Andel  <http://orcid.org/0000-0002-9363-4058>

References

- Alexander, D. A., & Klein, S. (2001). Ambulance personnel and critical incidents. *British Journal of Psychiatry*, 178, 76–81.
- Aquino, K., & Thau, S. (2009). Workplace victimization: Aggression from the target's perspective. *Annual Review of Psychology*, 60, 717–741.
- Bakker, A. B., Le Blanc, P. M., & Schaufeli, W. B. (2005). Burnout contagion among intensive care nurses. *Journal of Advanced Nursing*, 51, 276–287.
- Begg, D., Sullman, M., & Samaranyaka, A. (2012). The characteristics of young pre-licensed drivers: Evidence from the New Zealand drivers study. *Accident Analysis & Prevention*, 45, 539–546.

- Bigham, B. L., Jensen, J. L., Tavares, W., Drennan, I. R., Saleem, H., Dainty, K. N., & Munro, G. (2014). Paramedic self-reported exposure to violence in the emergency medical services (EMS) workplace: A mixed-methods cross-sectional survey. *Prehospital Emergency Care, 18*, 489–494.
- Bowling, N. A., & Beehr, T. A. (2006). Workplace harassment from the victim's perspective: A theoretical model and meta-analysis. *Journal of Applied Psychology, 91*, 998–1012.
- Brown, S. P., & Lam, S. K. (2008). A meta-analysis of relationships linking employee satisfaction to customer responses. *Journal of Retailing, 84*, 243–255.
- Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*, 193–213.
- Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. R. (1983). Assessing the attitudes and perceptions of organizational members. In S. Seashore, E. Lawler, P. Mirvis, & C. Cammann (Eds.), *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71–138). New York, NY: John Wiley.
- Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of Applied Psychology, 93*, 1082–1103.
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558–577.
- Crain, T. L., Schonert-Reichl, K. A., & Roeser, R. W. (2017). Cultivating teacher mindfulness: Effects of a randomized controlled trial on work, home, and sleep outcomes. *Journal of Occupational Health Psychology, 22*, 138–152.
- de Jonge, J., Dormann, C., Janssen, P. P., Dollard, M. F., Landeweerd, J. A., & Nijhuis, F. J. (2001). Testing reciprocal relationships between job characteristics and psychological well-being: A cross-lagged structural equation model. *Journal of Occupational and Organizational Psychology, 74*, 29–46.
- de Lange, A. H., Taris, T. W., Kompier, M. A., Houtman, I. L., & Bongers, P. M. (2005). Different mechanisms to explain the reversed effects of mental health on work characteristics. *Scandinavian Journal of Work, Environment & Health, 31*, 3–14.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*, 499–512.
- Dormann, C., & Zapf, D. (1999). Social support, social stressors at work, and depressive symptoms: Testing for main and moderating effects with structural equations in a three-wave longitudinal study. *Journal of Applied Psychology, 84*, 874–884.
- Faragher, E. B., Cass, M., & Cooper, C. L. (2005). The relationship between job satisfaction and health: A meta-analysis. *Occupational and Environmental Medicine, 62*, 105–112.
- Finkel, S. E. (1995). *Causal analysis with panel data*. Thousand Oaks, CA: Sage.
- Gormley, M. A., Crowe, R. P., Bentley, M. A., & Levine, R. (2016). A national description of violence toward emergency medical services personnel. *Prehospital Emergency Care, 20*, 439–447.
- Grandey, A. A., Kern, J. H., & Frone, M. R. (2007). Verbal abuse from outsiders versus insiders: Comparing frequency, impact on emotional exhaustion, and the role of emotional labor. *Journal of Occupational Health Psychology, 12*, 63–79.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion*. Cambridge, UK: Cambridge University Press.
- Hennig-Thurau, T., Groth, M., Paul, M., & Gremler, D. D. (2006). Are all smiles created equal? How emotional contagion and emotional labor affect service relationships. *Journal of Marketing, 70*, 58–73.
- Hershcovis, M. S., & Barling, J. (2010). Towards a multi-foci approach to workplace aggression: A meta-analytic review of outcomes from different perpetrators. *Journal of Organizational Behavior, 31*, 24–44.
- Homburg, C., & Stock, R. M. (2004). The link between salespeople's job satisfaction and customer satisfaction in a business-to-business context: A dyadic analysis. *Journal of the Academy of Marketing Science, 32*, 144–158.

- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55.
- Judge, T. A., & Kammeyer-Mueller, J. D. (2012). Job attitudes. *Annual Review of Psychology*, 63, 341–367.
- Judge, T. A., Piccolo, R. F., & Ilies, R. (2004). The forgotten ones? The validity of consideration and initiating structure in leadership research. *Journal of Applied Psychology*, 89, 36–51.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285–308.
- Kearney, K. A., Hopkins, R. H., Mauss, A. L., & Weisheit, R. A. (1984). Self-generated identification codes for anonymous collection of longitudinal questionnaire data. *Public Opinion Quarterly*, 48, 370–378.
- Lang, J., Bliese, P. D., Lang, J. W., & Adler, A. B. (2011). Work gets unfair for the depressed: Cross-lagged relations between organizational justice perceptions and depressive symptoms. *Journal of Applied Psychology*, 96, 602–618.
- Lapierre, L. M., Spector, P. E., & Leck, J. D. (2005). Sexual versus nonsexual workplace aggression and victims' overall job satisfaction: A meta-analysis. *Journal of Occupational Health Psychology*, 10, 155–169.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing Company.
- LeBlanc, M. M., & Kelloway, E. K. (2002). Predictors and outcomes of workplace violence and aggression. *Journal of Applied Psychology*, 87, 444–453.
- Leon-Perez, J. M., Notelaers, G., & Leon-Rubio, J. M. (2016). Assessing the effectiveness of conflict management training in a health sector organization: Evidence from subjective and objective indicators. *European Journal of Work and Organizational Psychology*, 25, 1–12.
- Lian, H., Ferris, D. L., Morrison, R., & Brown, D. J. (2014). Blame it on the supervisor or the subordinate? Reciprocal relations between abusive supervision and organizational deviance. *Journal of Applied Psychology*, 99, 651–664.
- Liu, Y., Mo, S., Song, Y., & Wang, M. (2016). Longitudinal analysis in occupational health psychology: A review and tutorial of three longitudinal modeling techniques. *Applied Psychology*, 65, 379–411.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, 51, 201–226.
- Meier, L. L., & Spector, P. E. (2013). Reciprocal effects of work stressors and counterproductive work behavior: A five-wave longitudinal study. *Journal of Applied Psychology*, 98, 529–539.
- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide: Statistical analysis with latent variables*. Los Angeles, CA: Muthén & Muthén.
- Neuman, J., & Keashly, L. (2004). *Development of the Workplace Aggression Research Questionnaire (WAR-Q): Preliminary data from the workplace stress and aggression project*. Paper presented at the Society for Industrial and Organizational Psychology, Chicago, IL.
- Nixon, A. E., Mazzola, J. J., Bauer, J., Krueger, J. R., & Spector, P. E. (2011). Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work & Stress*, 25, 1–22.
- Ottinot, R. C. (2008). The development and validation of the perceived workplace civility climate scale.
- Patterson, P. D., Weaver, M. D., Frank, R. C., Warner, C. W., Martin-Gill, C., Guyette, F. X., ... Callaway, C. W. (2012). Association between poor sleep, fatigue, and safety outcomes in emergency medical services providers. *Prehospital Emergency Care*, 16, 86–97.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903.
- Pugh, S. D. (2001). Service with a smile: Emotional contagion in the service encounter. *Academy of Management Journal*, 44, 1018–1027.

- Robinson, S. L., & O’Leary-Kelly, A. M. (1998). Monkey see, monkey do: The influence of work groups on the antisocial behavior of employees. *Academy of Management Journal*, *41*, 658–672.
- Satorra, A., & Bentler, P. M. (2010). Ensuring positiveness of the scaled difference chi-square test statistic. *Psychometrika*, *75*, 243–248.
- Schmitt, N., & Kuljanin, G. (2008). Measurement invariance: Review of practice and implications. *Human Resource Management Review*, *18*, 210–222.
- Spector, P. E. (1998). A control theory of the job stress process. In C. Cooper (Ed.), *Theories of organizational stress* (pp. 153–169). New York, NY: Oxford University Press.
- Tang, K. (2014). A reciprocal interplay between psychosocial job stressors and worker well-being? A systematic review of the “reversed” effect. *Scandinavian Journal of Work, Environment & Health*, *40*, 441–456.
- Taylor, S. G., Bedeian, A. G., Cole, M. S., & Zhang, Z. (2017). Developing and testing a dynamic model of workplace incivility change. *Journal of Management*, *43*, 645–670.
- The National Registry of EMTs. (2014). *LEADS update*. Retrieved from https://www.nremt.org/nremt/about/About_leads_2_survey.asp
- The National Registry of EMTs. (2015). *2014 National EMS practice analysis*.
- Tzeng, H.-M., Ketefian, S., & Redman, R. W. (2002). Relationship of nurses’ assessment of organizational culture, job satisfaction, and patient satisfaction with nursing care. *International Journal of Nursing Studies*, *39*, 79–84.
- Wangenheim, F. v., Evanschitzky, H., & Wunderlich, M. (2007). Does the employee–customer satisfaction link hold for all employee groups? *Journal of Business Research*, *60*, 690–697.
- Zablah, A. R., Carlson, B. D., Donovan, D. T., Maxham III, J. G., & Brown, T. J. (2016). A cross-lagged test of the association between customer satisfaction and employee job satisfaction in a relational context. *Journal of Applied Psychology*, *101*, 743–755.