VOLUME 39, NUMBER 4

October-December 2023

Avila Jacob, D.P.P.D.
Associate Professor, School of Concrete and Construction Management, Middle Tennessee State University, Murfreesboro, TN 37132. Email: jacob.avila@mtsu.edu

Dunbar Scott, D.B.A.
Associate Professor, Department of Business, California Baptist University, Riverside, CA 92504. Email: sdunbar@calbaptist.edu

ATMAE
PMB 219
8865 Norwin Ave STE 27
North Huntingdon, PA 15642

www.atmae.org

JTMAE
The Journal of Technology, Management, and Applied Engineering

Worklife and Burnout in the Concrete Industry—Part 2: Examining Role and Intent to Leave as Indicators of Burnout

Keywords:
Worklife; Job Burnout; Concrete Industry; Construction; Workload; Exhaustion; Cynicism; Professional Efficacy

ARTICLE

Jacob, A. & D. Scott. Worklife and Burnout in the Concrete Industry—Part 2: Examining Role and Intent to Leave as Indicators of Burnout. The Journal of Technology, Management, and Applied Engineering, 39(4), 2023, 1–12. https://doi.org/10.31274/jtmae.15625
Submitted: August 11, 2022; Accepted: September 14, 2023

Worklife and Burnout in the Concrete Industry—Part 2: Examining Role and Intent to Leave as Indicators of Burnout

ABSTRACT

Concrete industry professionals operate in a fast-paced and high-volume niche of the construction industry. Concrete is one of the most commonly used materials in the construction industry, and keeping up with demand often requires working long hours under stressful and dangerous conditions (Alvanchi et al., 2012; Bowen et al., 2014; Leung et al., 2008; Maslach & Leiter, 1997; Yang et al., 2018). In this study, the researchers used the Areas of Worklife Survey (AWS) and Maslach Burnout Inventory (MBI) to investigate factors contributing to burnout for professionals in the concrete industry. The internal consistency was tested for each of the dimensions of the AWS and MBI. Structural equation modeling was applied to analyze the structural relationships between the dimensions of the AWS and MBI. The results showed that respondents experienced heavy workloads and, subsequently, elevated exhaustion, cynicism, and high professional efficacy. This is Part 2 of a two-article series that examines the worklife and burnout phenomena for the concrete industry.

Introduction

This is the second article of a two-part series on employee burnout and worklife in the concrete industry. The study replicates a worklife and burnout study conducted in 2018 (Avila et al., 2021). The purpose of this research is to apply the procedures used in the 2018 study (Avila, et al.) to a different population in the construction industry. The first study (Avila et al., 2021) examined disaster restoration professionals in the construction industry, and this study examines concrete professionals. Part 1 introduces the background and theoretical basis of worklife and burnout, shares internal consistency analysis data, and examines the relationship between worklife and burnout as it relates to concrete industry professionals. Part 2 advances the conversation and discusses the impact that specific roles or positions have on burnout and what long-term employment intentions reveal about burnout one may be experiencing. Parts 1 and 2 share the same instruction, methodology, and statistical summary.

This study replicates a 2021 published article by Avila et al. titled "Burnout and Worklife in Disaster Restoration: Maslach Burnout Inventory and Areas of Worklife Survey." Replicating research allows for comparisons to be made with the original study results and can aid in validating/invalidating initial results. Additionally, research indicates that replication of studies provides merit in extending understanding of concepts or methods (Creswell & Creswell, 2018; Park, 2004). Researchers cannot generalize results outside of the present, as results are time-bound. Replicating a study at a later time can mitigate this threat to external validity (Creswell & Creswell, 2018). Lastly, replication of research can help control for biases. By replicating the original study, the authors validated the results of the original study and added new findings.

The concrete industry is a specialized niche within the construction sector, demanding expertise in material science, logistics, project management, and contracting, among other skills. Professionals in this field work long hours and must be readily available to handle dynamic events commonly found on construction sites. Their responsibilities encompass a wide spectrum, ranging from product design, delivery, and placement to sales, marketing, and contracting. Surprisingly, there has been limited research on burnout, worklife context, and turnover intentions in the concrete industry.

Over time, scholars have developed various measures to understand burnout (Maslach & Jackson 1981; Maslach et al., 2008, 2016; Pines et al., 1981), worklife context (Bakker & Demerouti, 2014; Leiter & Maslach, 2011), and engagement (Schaufeli & Bakker, 2004) across multiple industries. This study aims to contribute to the literature in two significant ways. Firstly, we apply the Maslach Burnout Inventory (MBI) and the Areas of Worklife Survey (AWS) in a sequence to a population that has not

been previously studied using similar instruments or to this extent. It is important to distinguish between burnout and engagement as separate phenomena, contrary to the view of some researchers who see them as opposite ends of the same spectrum (Schaufeli et al., 2002). Investigating these concepts within this unique industry will advance our understanding of their interrelations.

Secondly, this research adds to the literature by examining the dynamics of burnout, worklife context, and engagement specifically in the concrete industry, a distinct subset of the construction sector. Our aim is to identify behavioral and work-related trends that can enhance worker satisfaction, health, and performance while improving the overall effectiveness of processes for professionals and ultimately benefiting the customers they serve. In this pursuit, we focus on exploring the work attributes and worklife context that directly impact burnout among concrete industry professionals.

The work undertaken by concrete industry professionals is mentally and physically challenging, with many of them working long hours in hazardous environments. Stress faced by contractors often transfers to concrete service providers and contractors, making their job demanding. Even in the absence of external stressors, the inherent nature of the work and the pressure to meet deadlines in a dynamic environment pose significant challenges. Concrete industry professionals must be attuned to these dynamics and remain highly adaptable. The primary purpose of this study is to investigate the workplace factors influencing burnout among professionals in this industry.

Research Methods and Results

Respondents provided text-entries to multiple portions of the survey. These qualitative responses were coded. Eight items from the AWS were reverse coded. Datapoint labels were created for the SPSS datafile.

A total of 183 persons participated in the survey. Respondents who did not complete the survey ($N = 68$) were removed from the dataset prior to the analyses and were not included in any further quantitative statistical analyses. Specifically, 68 participants did not complete the AWS, and 62 participants did not complete the MBI. The final usable sample size was $N = 115$.

ITEM-LEVEL ANALYSES & SCORING

Missing values were analyzed on the AWS and MBI to determine whether a respondent demonstrated a systematic pattern when missing survey items. Results from the missing value analysis indicated that values were missing completely at random, that is, there was no systematic pattern when a respondent skipped items from the survey. Blanks in the survey were replaced with values that were estimated using the expectation maximization algorithm. This was done to keep all respondents who completed the survey, as survey blanks would disqualify and remove the participants from some analyses.

The AWS and MBI were scored according to their testing manuals, respectively. The AWS measures six dimensions of worklife: workload, control, reward, community, fairness, and values. Respondents indicate their agreement with each survey item on a 5-point scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) with the neutral response of 3 (*Hard to Decide*). The MBI measures three dimensions of burnout: exhaustion, cynicism, and professional efficacy. Survey participants selected a response on a scale ranging from 0 (*Never*) to 6 (*Every Day*). For all subscales, the mean score of items for that subscale was calculated and used as a respective subscale score.

Three questions regarding job search status were also included as an index of turnover intentions. Survey respondents were asked to choose between true and false for each question. The turnover intentions index was calculated by taking the sum of the equally weighted "true" responses.

PARTICIPANT DATA

Survey participants lived in 38 different geographical locations across the U.S. and Canada (i.e., states or provinces). Respondents were primarily male (94%). Participants' age and tenure information was collected as a categorical variable and is represented as follows in Tables 9 and 10.

Survey participants also reported their current role. Respondent role categories were as follows in Table 11.

Table 9.
Participants (N = 115) by age group

Category	Percent
18–24 years old	0.0%
25–34 years old	10.4%
35–44 years old	26.1%
45–54 years old	27.0%
55–64 years old	31.3%
65 years old and over	5.2%

Table 10.
Participants (N = 115) by tenure with employer

Category	Years worked for the current employer	Years worked in the current position	Years worked in the concrete industry
Less than 2 years	8.7	11.3	0.9
2–5 years	22.6	21.7	6.1
6–10 years	11.3	20.9	10.4
11–15 years	15.7	11.3	11.3
16–20 years	7.0	8.7	11.3
21 or more years	34.8	26.1	60.0

Data on the types of services and/or products that individuals' current employers provide were also collected. For this question, survey participants could select multiple answers. The type of services and/or products were as follows in Table 12.

STATISTIC SUMMARIES

Mean and standard deviation of the AWS and MBI by subscales are presented in the table below, respectively. The AWS uses a five-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The MBI utilizes a seven-point scale ranging from 0 (Never) to 6 (Every Day). Higher scores on workload, control, reward, community, fairness, and values indicate greater levels of worklife issues. Higher scores on exhaustion and cynicism indicate greater levels of burnout, and lower scores on professional efficacy indicate greater levels of burnout.

Test manuals of the AWS and MBI provide normative data from the general population. When compared to the normative data, survey participants reported significantly worse workload, $t(114) = -5.29$,

Table 11.
Participants (N = 115) by role

Role	Percent
Sales and marketing	12.2%
Estimating	5.2%
Owner or general manager	34.8%
Administrative	26.1%
Production management	2.6%
Field operations/technical services	19.1%

Table 12.
Services

Services	Percent
Concrete contracting	52%
Specialty concrete contracting	6%
Concrete testing and consulting	60%
Materials	32%
Equipment	60%
Ready mix	10%
Concrete pipe and related products	14%
Concrete block and related products	28%
Precast/prestressed products	46%
Repair and restoration	24%
Other (please specify)	24%

$N = 50$.

$p < 0.001$, significantly better levels of control, $t(114) = 6.15$, $p < 0.001$, significantly better fairness, $t(114) = 3.87$, $p < 0.001$, and significantly better values, $t(114) = 6.16$, $p < 0.001$. In terms of burnout, participants reported significantly higher levels of exhaustion, $t(114) = 7.57$, $p < 0.001$, significantly higher levels of cynicism, $t(114) = 3.71$, $p < 0.001$, and significantly higher levels of professional efficacy, $t(114) = 8.30$, $p < 0.001$. That is, when compared to the general population, concrete industry professionals have heavier workload, have better control over their work, perceive more

fairness at work, and have better person–organization fit. Additionally, persons working in the concrete industry feel more exhausted and more negative attitudes toward work, but they also feel more effective and capable at work.

Correlations between the nine subscale scores (three of the MBI and six of the AWS) were explored. People who reported higher scores in the areas of worklife (e.g., reasonable workload, better control over their work, etc.) reported less frequent feelings of exhaustion and cynicism. On the other hand, higher quality of worklife was associated with higher levels of professional efficacy.

Analysis 3: The Impact of Role/Position on Burnout

METHOD

Survey participants were asked to select their role/position with their current employer among eleven different response options: 1) Sales and marketing, 2) Estimating, 3) Owner, 4) General manager (GM), 5) Operations manager, 6) Administrative, 7) Production management, 8) Field operations, 9) Technical services, 10) Engineering, and 11) Other. As seen in Table 15 below, responses ($N = 115$) were not evenly distributed, and there were very few people in some roles.

Therefore, the data were separated into two groups: owner/GM and the rest of professionals in the concrete industry (i.e., non-owner). This is similar to the data split that was performed in the supplemental analyses requested to the 2018 report. A total of 115 survey respondents were

Table 13.
Areas of Worklife Survey

Areas of Worklife Survey (AWS)			
	μ	*M*	SD
Workload	2.96	2.57	0.80
Control	3.31	3.84	0.92
Reward	3.19	3.16	0.94
Community	3.38	3.36	0.75
Fairness	2.78	3.09	0.87
Values	3.24	3.67	0.75

$N = 115$. μ = Population Mean (Normative Data), M = Sample Mean, SD = Standard Deviation.

Table 14.
Maslach Burnout Inventory

Maslach Burnout Inventory (MBI)			
	μ	*M*	SD
Exhaustion	2.26	3.30	1.47
Cynicism	1.74	2.27	1.53
Professional efficacy	4.34	5.04	0.91

$N = 115$. μ = Population Mean (Normative Data), M = Sample Mean, SD = Standard Deviation.

Table 15.
Participants by position

Position	Percent
Sales and marketing	12.2%
Estimating	5.2%
Owner	16.5%
General manager	14.8%
Operations manager	14.8%
Administrative	5.2%
Production management	1.7%
Field operations	10.4%
Technical services	5.2%
Engineering	2.6%
Other	11.3%

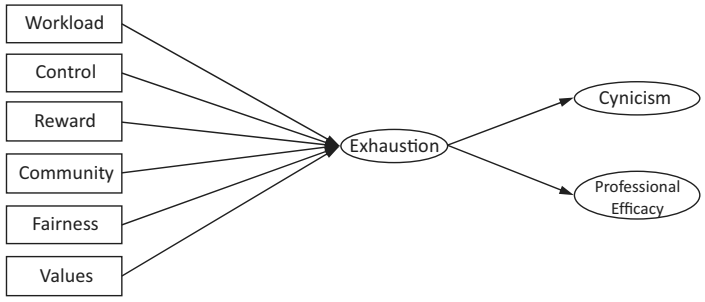
included in this part. Owner and GMs accounted for 35% of the sample. Other demographics are presented in "Statistic summaries."

A structural equation modeling (SEM) was performed through the AMOS (version 25.0.0) statistical package, employing a maximum likelihood parameter estimation (MLE) method. In this part, we modified the mediation model in Analysis 2 (see Figure 3). Instead of having latent variables of the AWS dimensions, manifest variables were used. In other words, average scores on each AWS dimension were calculated and used. Regression coefficients of the error terms over the AWS scale variables were fixed to the corresponding reliability coefficients.

RESULTS

In general, the results for the two groups were similar to each other; there were only a few small differences in the models between the two groups. Workload was a significant predictor of

Figure 3.
Modified Mediation Model of Areas of Worklife and Burnout.



exhaustion for both owner/GMs ($\beta = -0.47$, $p < 0.001$) and non-owners ($\beta = -0.54$, $p < 0.001$). Exhaustion was a significant predictor of cynicism for both the owner/GM group ($\beta = 0.76$, $p < 0.001$) and the non-owner ($\beta = 0.80$, $p < 0.001$) group. However, reward significantly predicted exhaustion only for the owner/GM data, $\beta = -0.40$, $p = 0.012$. On the other hand, exhaustion significantly predicted professional efficacy only with non-owners, $\beta = -0.37$, $p = 0.032$. See Tables 16 and 17 and Figures 4 and 5 for owner and non-owner results.

Table 16.
SEM analysis results with owners

Model	β	*b*	SE	*p*
Workload → Exhaustion	**−0.470**	**−0.672**	0.197	< 0.001
Control → Exhaustion	−0.180	−0.285	0.203	0.161
Reward → Exhaustion	**−0.397**	**−0.501**	0.200	0.012
Community → Exhaustion	−0.059	−0.093	0.241	0.699
Fairness → Exhaustion	−0.229	−0.359	0.264	0.174
Values → Exhaustion	0.058	0.091	0.262	0.727
Exhaustion → Cynicism	**0.762**	**0.873**	0.218	< 0.001
Exhaustion → Professional Efficacy	−0.215	−0.065	0.064	0.313

Note: Bolded values are significant at the 0.05 level (2-tailed). β = standardized regression coefficients, *b* = unstandardized regression coefficients, SE = standard error.

Table 17.
SEM analysis results with non-owners

Model	β	*b*	SE	*p*
Workload → Exhaustion	**−0.542**	**−0.752**	0.173	<0.001
Control → Exhaustion	−0.043	−0.049	0.123	0.690
Reward → Exhaustion	−0.214	−0.253	0.136	0.063
Community → Exhaustion	−0.213	−0.312	0.168	0.063
Fairness → Exhaustion	0.032	0.043	0.157	0.782
Values → Exhaustion	0.018	0.030	0.191	0.874
Exhaustion → Cynicism	**0.801**	**1.176**	0.204	<0.001
Exhaustion → Professional Efficacy	**−0.369**	**−0.118**	0.055	0.032

Note: Bolded values are significant at the 0.05 level (2-tailed). β = standardized regression coefficients, *b* = unstandardized regression coefficients, SE = standard error.

Figure 4.
SEM Analysis Results When Fitted to the Owner Data (Standard Estimates).

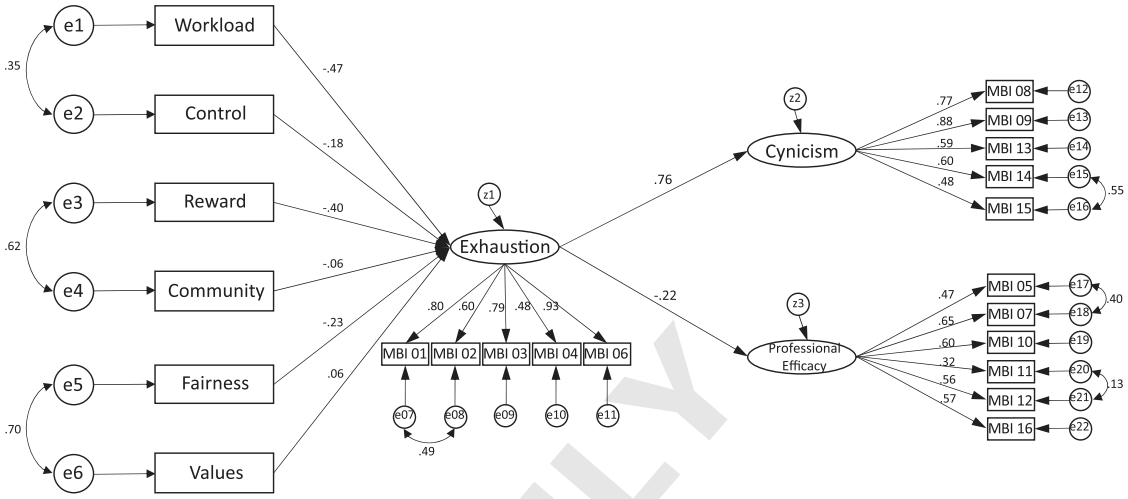
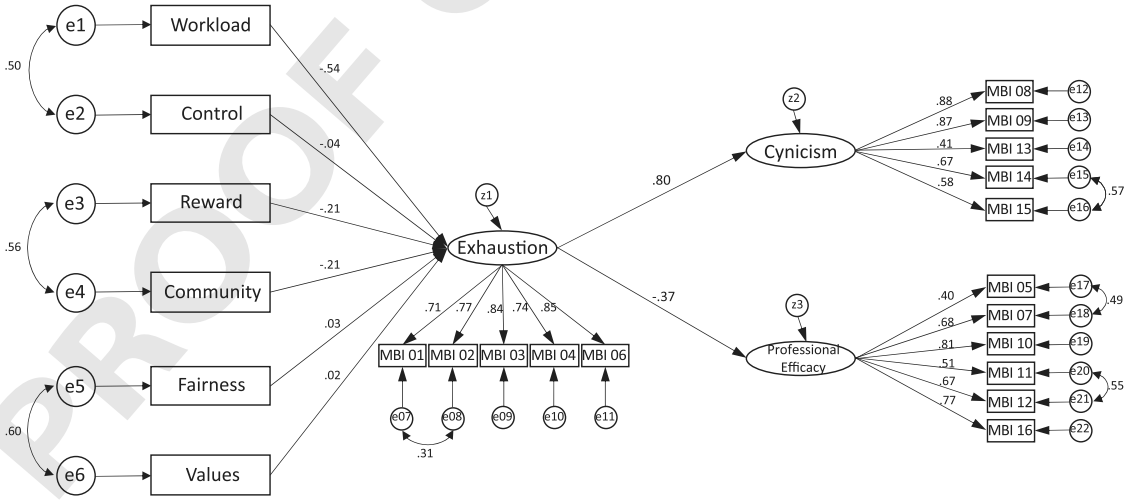


Figure 5.
SEM Analysis Results When Fitted to the Non-Owner Data (Standard Estimates).



According to the AMOS analysis guideline, manifest/observed variables (e.g., scaled scores of AWS dimensions and survey items) are presented in rectangles, whereas latent variables and measurement errors are presented in circles.

INTERPRETATION

In Analysis 3, we explored data to determine whether the role or position someone has in the concrete industry has an effect on burnout. Data were separated into two groups: owner/GMs and non-owners. The results indicated that roles may not have a major impact on the relationship between areas of worklife and burnout. Regardless of their role, concrete professionals feel more exhausted when they have heavier workload. Then, the high level of exhaustion leads to a high level of cynicism. Only for non-owners, higher exhaustion leads to less professional efficacy. Owner level of exhaustion does not meaningfully affect their level of professional efficacy. However, the results should be interpreted with caution. The sample is too small, and the roles are not equally represented in the data to make strong conclusions about the group differences.

Analysis 4: Burnout and Intent to Leave

METHOD

Previous studies have demonstrated that the concrete professionals' areas of worklife level affects their burnout level. In Analysis 4 of this study, we further explored whether a high level of burnout leads to higher turnover intentions. Survey participants were asked about their job search status with three questions: "I often think about quitting," "I will probably look for a new job within the next year," and "I am actively searching for a new job." The responses were coded into 1 = *true* and 0 = *false*.

A total of 115 survey responses were included in this analysis. Sample demographics are presented in "Statistic summaries" (on page 4). A structural equation modeling (SEM) was performed through the AMOS (version 25.0.0) statistical package, employing an MLE method. In Analysis 4, we added a turnover intention latent variable to the mediation model from Analysis 3. It was expected that cynicism and professional efficacy dimensions of burnout would predict people's intent to leave the job. Refer to Figure 6.

RESULTS

Overall, the model fit indices showed mixed results. This might be due to the small sample size. The chi-square to degrees of freedom ratio ($\chi^2/df = 2.15$) was much lower than 5, showing a good fit. However, Comparative Fit Index (CFI = 0.82) and Root Mean Square Error of Approximation (RMSEA = 0.100) were not within the standard limits to show a good fit.

The results showed that turnover intentions were significantly predicted by cynicism ($\beta = 0.65$, $p < 0.001$) and professional efficacy ($\beta = -0.23$, $p = 0.038$) factors of burnout. Within the burnout factors, both cynicism and professional efficacy were predicted by exhaustion, $\beta_{cynicism} = 0.80$, $p_{cynicism} < 0.001$; $\beta_{professional\ efficacy} = -0.33$, $p_{professional\ efficacy} = 0.014$. Lastly, the workload and reward domains of the AWS were significant predictors of exhaustion, $\beta_{workload} = -0.48$, $p_{workload} < 0.001$; $\beta_{reward} = -0.24$, $p_{reward} = 0.014$. See Table 18 and Figure 7 for results. According to the AMOS analysis guideline, manifest/observed variables (e.g., scaled scores of AWS dimensions and survey items) are presented in rectangles, whereas latent variables and measurement errors are presented in circles.

INTERPRETATION

The workload dimension is the most important predictor of exhaustion, followed by reward. Specifically, the heavier one's workload is, the more exhausted concrete professionals feel. Less recognition—financial or social—for contributions on the job also makes individuals feel more exhausted. Exhaustion then leads to cynicism and professional efficacy, which means that more exhausted people feel more indifferent toward their work and less effective at their work. Last but not least, those individuals who are more cynical toward their work and feel less efficacious with their work tend to have stronger intentions to leave their job. Based on the relationship, if employers in the concrete industry would like to reduce turnover and retain their employees, the level of employee burnout and areas of worklife should be examined.

Figure 6.
Modified Mediation Model of Areas of Worklife, Burnout, and Turnover Intention.

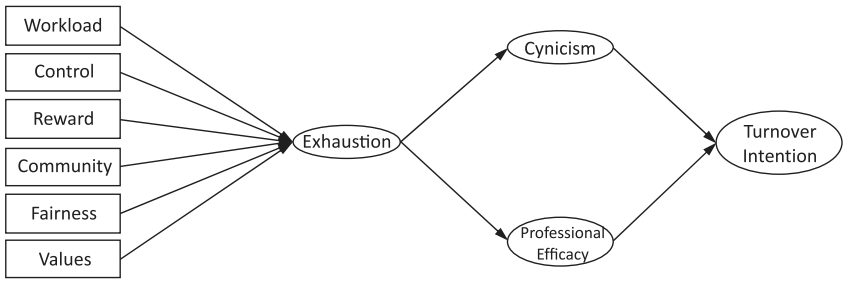
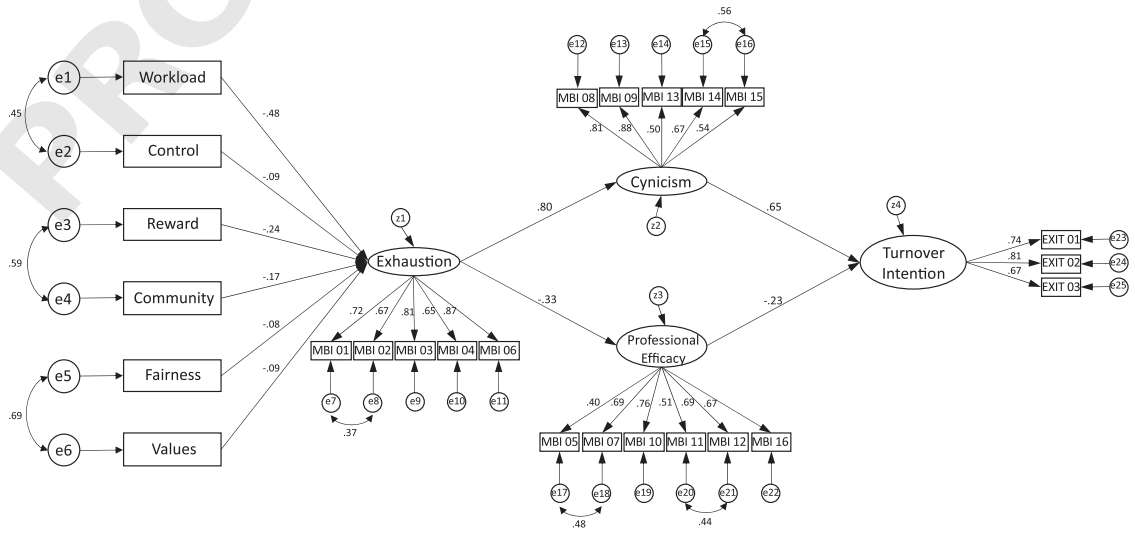


Table 18.
Burnout and intent to leave SEM analysis results

Model	β	*b*	SE	*p*
Workload → Exhaustion	**−0.478**	**−0.642**	0.130	<0.001
Control → Exhaustion	−0.092	−0.108	0.102	0.288
Reward → Exhaustion	**−0.240**	**−0.274**	0.112	0.014
Community → Exhaustion	−0.166	−0.237	0.138	0.085
Fairness → Exhaustion	−0.079	−0.098	0.131	0.456
Values → Exhaustion	−0.094	−0.136	0.153	0.375
Exhaustion → Cynicism	**0.804**	**1.087**	0.160	<0.001
Exhaustion → Professional Efficacy	**−0.334**	**−0.106**	0.043	0.014
Cynicism → Turnover Intention	**0.653**	**0.162**	0.029	<0.001
Professional Efficacy → Turnover Intention	**−0.234**	**−0.247**	0.119	0.038

Note: Bolded values are significant at the 0.05 level (2-tailed). β = standardized regression coefficients, *b* = unstandardized regression coefficients, SE = standard error.

Figure 7.
Burnout and Intent to Leave SEM Analysis Results (Standard Estimates).



References

Alvanchi, A., Lee, S., & AbouRizk, S. (2012). Dynamics of working hours in construction. *Journal of Construction Engineering and Management*, *138*(1), 66–77. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000384

Avila, J., Rapp, R., Dunbar, S., & Jackson, A. (2021). Burnout and worklife in disaster restoration: Maslach Burnout Inventory and Areas of Worklife Survey. *Journal of Construction Engineering and Management*, *147*(2).

Bakker, A., & Demerouti, E. (2014). *Job demands-resources theory*. In *Wellbeing: A complete reference guide*, edited by C. Cooper and P. Chen, 37–64. Wiley-Blackwell.

Bowen, P., Edwards, P., Lingard, H., & Cattell, K. (2014). Predictive modeling of workplace stress among construction professionals. *Journal of Construction Engineering and Management*, *140*(3). https://doi.org/10.1061/(ASCE)CO.1943-7862.0000806

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications, Inc.

Leiter, M., & Maslach, C. (2011). *Areas of Worklife Survey: Manual and sampler set* (5th ed.). Mind Garden.

Leung, M.-y., Chan, Y.-S., & Olomolaiye, P. (2008). Impact of stress on the performance of construction project managers. *Journal of Construction Engineering and Management*, *134*(8), 644–652. https://doi.org/10.1061/(ASCE)0733-9364(2008)134:8(644)

Maslach, C., & Jackson, S. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, (2), 99–115.

Maslach, C., Jackson, S., Leiter, M., & Schaufeli, W. (2016). *The Maslach Burnout Inventory: Manual* (4th ed.). Mind Garden.

Maslach, C., & Leiter, M. (1997). *The truth about burnout*. Jossey-Bass.

Maslach, C., Leiter, M., & Schaufeli, W. (2008). *Measuring burnout*. In *The Oxford handbook of organizational well-being*, edited by C. Cooper and S. Cartwright, 86–108. Oxford University Press.

Park, C. L. (2004). What is the value of replicating other studies? *Research Evaluation*, *13*(3), 189–195. https://doi.org/10.3152/147154404781776400

Pines, A., Aronson, E., & Kafry, D. (1981). *Burnout: From tedium to personal growth*. Free Press.

Schaufeli, W., & Bakker, A. (2004). *Utrecht Work Engagement Scale: Preliminary manual* (1.1 ed.). Occupational Health Psychology Unit, Utrecht University.

Schaufeli, W., Salanova, M., Gonzalez-Roma, V., & Bakker, A. (2002). The measurement of engagement and burnout: A confirmative analytic approach. *Journal of Happiness Studies*, (3), 71–92.

Yang, F., Li, X., Song, Z., & Li, Y. (2018). Job burnout of construction project managers: Considering the role of organizational justice. *Journal of Construction Engineering and Management*, *144*(11). https://doi.org/10.1061/(ASCE)CO.1943-7862.0001567