

# **A Quantitative Analysis of Managers' Job Uncertainty, Complexity, Variety, Interdependence, Job Satisfaction, and Turnover Intent within the U.S. Construction Industry**

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## **ABSTRACT**

The predictors of turnover intention among construction managers in the U.S. are examined. This article uses a quantitative correlational multiple linear regression to examine the relationships among construction managers' job uncertainty, complexity, variety, interdependence, job satisfaction, and turnover intent in the United States. Previous studies have shown that turnover intent rates continue to reach new highs, with no signs of slowing in the U.S. and many other countries. Although researchers have recognized the importance of turnover intent, job uncertainty, complexity, variety, interdependence, and job satisfaction individually, their combined effects remain under-investigated. Therefore, this quantitative study aims to identify predictors of potential turnover intent among managers in the United States construction industry. The empirical findings highlight the moderate predictive relationship between job satisfaction and turnover intent, suggesting that improving job satisfaction may help reduce turnover intentions. However, the factors of job uncertainty, complexity, variety, and interdependence were not statistically significant predictors of turnover intent. These findings align with the push-pull-mooring theory, which explains most migration behaviors, and, alternatively, the two-factor theory, which explains that executive managers must establish a link between essential hygiene and motivator factors. This study contributes to understanding the importance of construction companies' specific needs and perceptions. Finally, the study invests in measures to promote job satisfaction and retention to mitigate the challenges posed by high turnover rates in the industry.

*Keywords:* Construction industry, human resource management, job interdependency, job satisfaction, job uncertainty, job variety, push-pull-mooring theory, turnover intention.

## Introduction/Background

Turnover intention is an employee's voluntary intention to leave an organization. The turnover intention rate is high and poses a significant challenge for construction companies (Rumawas, 2022). Employee turnover rates continue to reach new highs, with no signs of slowing in the U.S. and many other countries (Kashmoola et al., 2017; Rumawas, 2022). The U.S. Bureau of Labor Statistics (2024b) reported increased gross job losses in the construction sector from 2014 to 2023. Similarly, Rumawas (2022) explains that turnover intent will remain a significant problem in the 21st century. Studies indicate that employee turnover costs in some sectors can exceed 20% of salaries, including expenses for recruitment, training, consulting, and lost productivity (Rumawas, 2022; Vakira et al., 2023). Therefore, we must consider the impact of turnover intent (TI) on job uncertainty, complexity, variety, and interdependency (JUCVI), as well as on job satisfaction (JS).

There are several types of construction managers. Architects, civil engineers, and construction managers work in various capacities, including design, consulting, and site supervision (Ayalp, 2022). Due to the nature of their work, these managers experience high levels of work pressure (Kasa et al., 2023). A 2018 survey indicates that approximately 60% of employees are dissatisfied with their jobs, compared to 20% in the 1960s (Gomez-Mejia et al., 2020). This survey indicated employees' sentiment about their work. In general, Devi et al. (2023) found that approximately 3.5 million Americans voluntarily leave their jobs each month. As a result of these working conditions, the construction industry in the United States is experiencing a decline in productivity, conflicts that affect project performance, and managerial turnover intentions (Ayalp, 2022). Therefore, it is worthwhile to investigate the predictors of turnover intent in the United States construction sector.

The objective of this study is to address this research gap by examining the relationships among JUCVI and JS, as independent variables, and TI, as the dependent variable, among construction managers in the United States. This research used the push-pull-mooring theory to examine employee turnover intent. The study also drew on Frederick Herzberg's two-factor theory to explain employee behavior in terms of extrinsic and intrinsic factors (Chang et al., 2023; Yousaf, 2020). Furthermore, there is a lack of academic research on managers' turnover intentions and the effects of JUCVI and JS on them. TI has been extensively explored in relation to managers (Ayalp, 2022; Borg et al., 2023; Ekrot et al., 2018; Lehtonen et al., 2022; Mubarak et al., 2023; Uğural et al., 2020). However, the current literature does not evaluate the relationships among JUCVI, JS, and TI.

The problem examined in this study is the lack of insight into predictors of high turnover intent among managers in the United States construction industry (Ayodele et al., 2022; Rumawas, 2022; Wu et al., 2019; Uğural et al., 2020). High turnover intention among managers in the United States construction industry can lead to higher project costs, decreased morale and productivity, disruption of project workflows, and erosion of competitive advantages (Fan et al., 2024; Uğural et al., 2020; Wu et al., 2019). The industry faces a talent retention crisis (Aghimien et al., 2024). Employees' intentions to quit could signal poor work performance, poor well-being, and ineffective organizational processes (Liswandi & Muhammad, 2023). Other psychological stressors contributing to TI include long hours, heavy workloads, job uncertainty, and the need to stay connected 24/7 (Jugdev et al., 2018). Therefore, employers must recognize managers' TI to limit its negative consequences in their organizations (Borg & Scott-Young, 2022). The

consequences of TI, in turn, raise the question of whether JUCVI predicts TI among managers in the construction sector.

The purpose of this quantitative study was to identify predictors of turnover intention among managers in the United States construction industry. The researcher gained insight into these predictors of turnover intent by examining the relationship among JUCVI, JS, and TI among managers in the U.S. construction industry. This research was conducted through the lens of the push-pull-mooring theory to examine factors influencing employee turnover intent (Chang et al., 2023). The study also applied Frederick Herzberg's two-factor theory of motivation to explain how individuals behave in their employment (Yousaf, 2020). After conducting a thorough literature review, no such study examining the relationship among JUCVI, JS, and TI among managers in the U.S. construction industry was found.

This study builds on the work of Chang et al. (2023), who integrated the push-pull-mooring theory to explain outcomes of push and pull dynamics and examined how each factor influences employee migration from one company to another. A limitation of Chang et al.'s (2023) study was its exclusive focus on employees in Taiwan. This limitation presents an opportunity for further research in the United States. This research employed the push-pull-mooring theoretical framework (Lee, 1966; Moon, 1995) and Frederick Herzberg's two-factor motivation-hygiene theory (1959) (Chang et al., 2023; Yousaf, 2020). Understanding the relationship between JUCVI and JS, and how they influence TI, is crucial for modern organizations and warrants further investigation. Consequently, the research question and hypotheses that follow were formulated:

RQ: How do job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) affect the turnover intent (TI) of managers in the U.S. construction industry?

H0: Job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) do not affect the turnover intent (TI) of managers in the U.S. construction industry.

Ha: Job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) do affect the turnover intent (TI) of managers in the U.S. construction industry.

This study used three research instruments: the Turnover Instrument Survey (TIS-6) to measure the turnover intention criterion variable; Dean and Snell's (1991) job uncertainty, complexity, variety, and interdependency survey instrument; and Paul Spector's (1985) Job Satisfaction Survey (JSS). A G\*Power analysis indicates that at least 68 participants should be included in the study (Faul et al., 2009). The minimum sample size was increased by 25% to account for potential attrition, resulting in a target sample of 85 participants. The study employed a correlational design to examine relationships among variables, as this design is most suitable for achieving the study's objective.

## Literature Review

According to Carter et al. (2019), turnover costs are estimated to be about 20% or more of an employee's wage, including productivity losses and training expenses. Edmondson & Matthews (2022) present an alternative perspective, suggesting that the intention to quit results in approximately \$500 billion in productivity losses for U.S. companies, underscoring the importance of employee retention for businesses. Although turnover can sometimes have positive effects, as it facilitates the redistribution of work and allows companies to retain only the essential workers needed for operations based on economic conditions, it is not always

advantageous (Egemen, 2024). Rumawas (2022) also emphasizes that turnover intention will remain a significant concern in the 21st century.

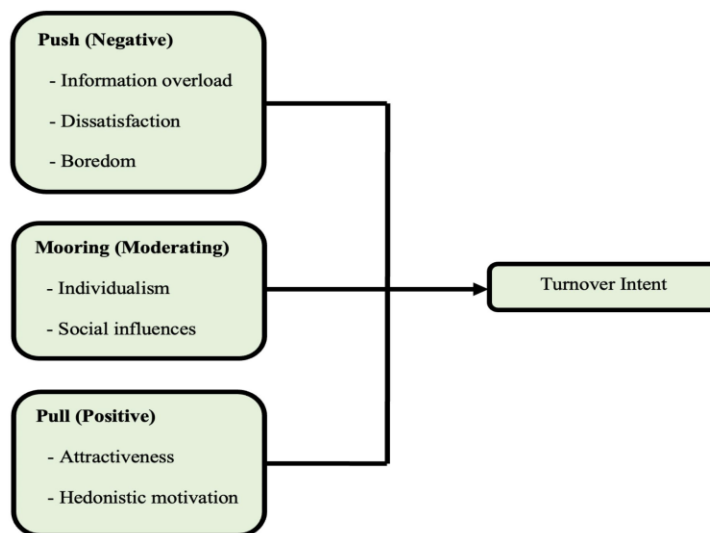
The push-pull-mooring (PPM) theory provides a framework for understanding the transition of intent from one original position to another. Initially developed to examine how individuals migrate from one place to another (Chang et al., 2023), the PPM model, as noted by Lin and Wu (2020), stems from the push-pull theory and elucidates individual decision-making processes regarding migration within population studies.

In his seminal work, Lee (1966) proposed that migration can be classified as voluntary or involuntary and as internal or external. Lin and Wu (2020) observed that the PPM framework categorizes factors influencing turnover into three distinct groups: push, pull, and mooring. The push-pull element of the PPM framework traces back to the nineteenth century when Ernest George Ravenstein presented the “Laws of Migration” to the Royal Statistical Society in 1885 (Carling, 2024; Lee, 1966). Four years later, Ravenstein (1889) revisited his paper on the “Laws of Migration,” asserting that both positive and negative processes influence individuals’ migration behaviors.

Criticism of the push-pull mooring framework centers on its theoretical assumptions, geographic limitations, and its static, nineteenth-century roots. The theory’s static nature failed to adapt to changing times and individual circumstances (Carling, 2024; De Haas, 2021; Lisana, 2023). A significant contribution of the PPM theory is the introduction of the concept of “moorings” by Longino (1992). Moon (1995) later incorporated “mooring” into the push-pull model, expanding the migration theory more comprehensively. Recent studies show that moorings are individual or spatial factors that facilitate or hinder migration decisions (Jo & Park, 2023; Lisana, 2023; Marozva et al., 2024).

## Figure 1

### *Three Dimensions of the Push-Pull-Mooring (PPM) Framework*



*Note.* The Push-Pull-Mooring (PPM) theoretical framework examines factors influencing construction managers’ intentions to leave their positions.

These psychosocial factors influence individual migration, including the intention to move from one geographic location to another, and can also be applied to employment. The PPM framework has also been widely used in the social sciences, especially in business management, to clarify individual behavior regarding employment migration (Jo & Park, 2023; Wang et al., 2023). Nevertheless, it remains essential to continuously reassess and refine our understanding of the PPM model as this theory evolves. Understanding the relationship among JUCVI, JS, and TI through the PPM framework helps navigate and predict construction managers' intent to leave their organizations.

Significant research into workforce motivation conducted in the mid-twentieth century includes works by Maslow (1954), Herzberg et al. (1959), Vroom (1964), Alderfer (1972), McClelland (1961), and Locke et al. (1981) (Büyükbese et al., 2023; Madiistriyatno et al., 2023; Ozsoy, E. 2019; Steers et al., 2004). Bassett-Jones and Lloyd (2005) referred to these foundational studies on job satisfaction as motivation theories championed by Herzberg and his colleagues.

Several current studies on individuals' employment behavior are based on Frederick Herzberg's two-factor theory of motivation (Ayalp, 2022; Cavar et al., 2023; Ngoc Luu et al., 2022; Yousaf, 2020). While Holmberg's research emphasizes intentions, Herzberg (1966) argues that employee satisfaction stems from the degree of enjoyment or maintenance resulting from their cognitive evaluation of various factors. Workers' evaluations can be positive, negative, or a recipe of both (Herzberg, 1966). Spector (1997) characterized job satisfaction as the level of enjoyment (satisfaction) or displeasure (dissatisfaction) that individuals experience in their work.

Management and its style can significantly influence job satisfaction and turnover. Hosseini et al. (2014) confirmed that employee satisfaction is a psychological state that individuals experience regarding their jobs. Egemen (2024) concurred with Hosseini et al. (2014) that job satisfaction is the emotional state resulting from an evaluation of one's job experience and reflects the employee's feelings. These feelings toward the organization, perceived from various perspectives, could lead to intentions to stay or leave.

## Figure 2

### *A Comparative Exploration of Satisfaction and Dissatisfaction Perspectives*



*Note.* Herzberg proposed a dual continuum model of motivation in which “satisfaction” motivators and “dissatisfaction” hygiene factors are treated as separate dimensions. Adapted from *Organizational Behavior* (p. 219), by Robbins, S. P., and Judge, T. A., 2018, 18th Edition. VitalSource Bookshelf. Retrieved from [vbk://9780134729749](https://vbk://9780134729749). Copyright 2018 by VitalSource Bookshelf.

The two-factor theory of motivation explains how individuals behave in their jobs by distinguishing between extrinsic (hygiene) factors that diminish satisfaction and intrinsic factors (motivators) that enhance satisfaction (Herzberg et al., 1959). Traditionally known as the motivation-hygiene theory, this theory is mainly referred to as Herzberg's two-factor theory or dual-factor theory (Holmberg et al., 2016; Munawwarah & Chaerudin, 2024). Xie et al. (2022) applied Herzberg's two-factor theory to analyze construction employees' behavior in the workplace. Yousaf's (2020) study highlighted that Maslow's hierarchy of needs inspired Herzberg's motivation theory. Likewise, many studies suggest that the two-factor theory of motivation clarifies the relationship between job satisfaction and turnover intention by ensuring that fundamental hygiene and motivational factors are either met or unmet (Cavar et al., 2023; Yousaf, 2020).

Criticisms have centered on Herzberg's original methodology and assumptions (Bassett-Jones & Lloyd, 2005; Ruthankoon & Ogunlana, 2003; Yousaf, 2020). Bassett-Jones and Lloyd (2005) argued that if hygiene and motivational factors are equally important to an individual, both should be capable of providing motivation. Similarly, Deci et al. (2001) found that extrinsic rewards can adversely impact intrinsic motivation. Nevertheless, interest in Herzberg's two-factor theory has expanded, and it remains highly relevant and is regarded as one of the most significant motivation theories affecting job satisfaction (Holmberg et al., 2016; Yousaf, 2020).

This research builds on Yousaf's (2020) study. Yousaf applied Frederick Herzberg's two-factor theory of motivation to explain how individuals behave in their employment based on extrinsic and intrinsic conditions. Although Yousaf's (2020) study is limited geographically, as it was conducted in Pakistan, the author advocates for further research on the theory using additional independent and dependent variables, such as turnover. This study ultimately addresses the call for further research by Kerndgern and Thanitbenjasith (2017), who examined the influence of leadership on job satisfaction and turnover intention in the construction industry in Thailand. Their work called for more research into the relationship between job satisfaction and turnover intention among top managers.

Job design influences how construction managers perform their tasks. Dean and Snell (1991) utilized the job uncertainty, complexity, variety, and interdependency (JUCVI) to demonstrate how job design affects workers' skills and task performance. Dean and Snell (1991) also use JUCVI to illustrate the difficulty of workers' integration into the business enterprise. Job satisfaction occurs when observed performance meets or exceeds individual expectations. According to Saufi et al. (2023), turnover intent refers to an employee's conscious and voluntary desire to leave their organization in search of a better job opportunity.

## Methods

This study employed a quantitative, correlational design and multiple linear regression to examine the predictive relationships among JUCVI, JS, and TI among managers in the U.S. construction industry. This study assesses the influence of JUCVI and JS, as independent variables, on TI, as the dependent variable, among managers in the United States construction sector. Consequently, the research question and hypotheses that follow were formulated:

**RQ:** How do job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) affect the turnover intent (TI) of managers in the U.S. construction industry?

**H<sub>0</sub>:** Job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) do not affect the turnover intent (TI) of managers in the U.S. construction industry.

**H<sub>a</sub>:** Job uncertainty, complexity, variety, interdependency (JUCVI), and job satisfaction (JS) do affect the turnover intent (TI) of managers in the U.S. construction industry.

### **Population of the Study**

The population of this study comprises construction-sector managers aged 18 or older residing in the United States. In 2023, there were about 10.3 million construction workers and 329,190 construction managers in the U.S. (United States Bureau of Labor Statistics, 2024a; IBISWorld, 2024). A G\*Power calculation in Figure 4 shows that the study needed at least 68 participants to achieve 0.8 power. G\* Power version 3.1.9.6, illustrated in Figure 3, was used to calculate the study's total sample size of 68 participants. Responses to the surveys were collected using a Likert-type scale, with various anchors provided for each item. This research required 68 managers ( $n = 68$ ) in the construction sector in the United States. This estimate relied on an F-test for the family and on multiple linear regression. The participants were selected via convenience sampling, as it is the most common sampling method used by students and researchers (Gliner et al., 2017).

### **Reliability of the Research**

Comparisons were conducted for both the 4-month and 4-year periods following the end of the survey (Bothma & Roodt, 2013). A Serbian study published in *Engineering Economics* utilized TIS-6 to assess the turnover intention of 100 human resource professionals and reported a Cronbach's alpha of 0.711 (Ivanovic et al., 2020). The JSS instrument has a coefficient alpha of .91 and has shown strong reliability over time (Spector, 1985). Similarly, Cronbach's alpha ( $\alpha$ ) for job uncertainty and other groups within the instrument ranges from 0.69 to 0.80 (Dean & Snell, 1991). Finally, according to Roodt (2004), the TIS-6 has a Cronbach's alpha of 0.80. Survey responses were scored in Microsoft Excel-based on the specific instrument instructions and analyzed using R and RCmdr statistical software and a graphical user interface (GUI).

Furthermore, Dean and Snell's (1991) survey instrument comprises 17 items, each with different response anchors; the Turnover Intention Questionnaire (TIS-6) from Roodt (2004) comprises 6 items; and the Job Satisfaction Survey (JSS) from Spector (1994) comprises 36 items. Moreover, there were two screening questions and four demographic questions. The screening and demographic questions cover residence, position, age, gender, education level, and tenure. The TIS-6 and JSS instruments were administered using Likert scales from 1 to 5 and 1 to 6, respectively, and responses to the JUCVI survey questions were collected on a 7-point Likert-type scale.

### **Data Collection and Analysis**

#### ***Participant Recruitment and Survey Implementation***

A third-party vendor, Prolific.com, was selected to securely obtain a sample. Prolific.com was selected because the platform provides tools for delivering high-quality responses. Prolific.com provides quality-control features, including bot detection, attention checks, and IP address duplication checks. The survey used proactive control prompts, as these items have been shown to detect inattention (Wiwatowska et al., 2022). The use of bot recognition technology is essential, as increased bot activity was identified beginning in the summer of 2018 (Chmielewski & Kucker, 2019). An email was sent to selected individuals, inviting them to participate in a voluntary online questionnaire. The researcher included screening questions to confirm that

participants were 18 or older, employed as managers in the construction sector, and residing in the United States. Participants who were not employed as managers in the construction industry and who did not reside in the United States were excluded from further participation in the survey. Therefore, a quantitative approach is appropriate, as the researcher aims to evaluate managers' turnover intentions in the U.S. construction sector, which poses significant challenges for observation.

### ***Ethical Adherence and Data Retention***

The Belmont Report is recognized in the United States and globally as the primary source for establishing ethical standards that hold research participants accountable for protecting human subjects in research studies (Serpico, 2024). According to the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979), respect for persons encompasses two key ethical considerations: adherence to fundamental ethical principles and guidelines for informed consent. The basic ethical principles state that respect for persons means treating individuals as autonomous agents, while those with diminished autonomy are entitled to protection. The researcher involved only participants of legal age (18 and older) who can make informed decisions. There was no coercion to participate in the survey; participation is entirely voluntary. Moreover, the researcher does not benefit monetarily from this exercise.

Prolific sourced all participants without bias regarding race, ethnicity, education, or other factors to ensure that all participants are treated equally, thus indicating that justice is upheld. The Prolific program continuously handled the survey responses until the study concluded. Any surveys that were not completed were removed from the analysis. The survey data were exported to Microsoft Excel, cleaned and organized, and then imported into R Commander for analysis. Tabulation will be performed to ensure the completeness and accuracy of the data between the R Commander and the original Prolific data.

To ensure confidentiality and anonymity, access to respondent data will be controlled through password-protected, encrypted files. Additionally, anonymity will be preserved by omitting individual identifiers, such as IP addresses and specific demographic information, from the dataset. All electronic versions of the survey data will be stored securely on a password-protected cloud platform with controlled access to prevent unauthorized access. Data will be kept for three years and then permanently deleted from all devices, except for any unstructured data used in the analysis.

### **Limitations**

This research has several limitations. First, it focuses exclusively on a sample from the United States. This geographic limitation influences the return rate and limits generalization. Additionally, the researcher gathers insights solely from construction managers, excluding subordinates and leaders. Another constraint involves the study's limited outcomes. Since quantitative research typically employs structured questionnaires with closed-ended questions, it restricts the conclusions that can be drawn. The investigation was explicitly limited to predicting the relationships among job uncertainty, complexity, variety, interdependence (JUCVI), job satisfaction (JS), and turnover intention (TI) among construction managers. The research was also constrained by the time allotted for the study. The selected methodology, research design, and data collection and analysis methods were determined beforehand to meet the goals of this study.

## Results and Discussion

The target population consisted of construction industry managers in the United States. The researcher used the Prolific Internet survey tool to recruit participants and create a sample that accurately represents the U.S. population of construction managers. Similarly, an online survey was developed using Qualtrics, a web-based software platform. The survey was conducted after the Institutional Review Board (IRB) approval. The G\*Power sample size calculator indicated that at least 68 participants were required to achieve adequate statistical power, as shown in Figure 4. Quantitative data analysis and multiple linear regression were designed to examine the predictive relationship among JUCVI, JS, and TI among managers in the U.S. construction industry.

The effect size in multiple regression indicates the magnitude and practical importance of the difference between the independent and dependent variables, or the strength of the relationship between them (Kang, 2021; Maher et al., 2013). According to Cohen (1988), effect sizes of 0.8, 0.5, and 0.2 standard deviation units correspond to large, moderate, and small effect sizes, respectively (Kang, 2021). In the case of this dissertation, a 0.89 was considered large. This result indicates that the predictors (JUCVI and JS) account for a substantial portion of the variation in the outcome variable (TI).

Table 1 shows that the test sample consisted of 27% females and 73% males. The participants' ages ranged from 18 to 66+, with most (32%) falling into the 26–35 and 36–45 age categories, accounting for 64% of participants across both groups. The years of experience category showed that 48% of respondents had between six and ten years, while 37% had between zero and five years, totaling 85% across the two groups. The other groups had tenure exceeding 10 years. Regarding respondents' educational backgrounds, 30% were high school graduates, 15% held an associate's degree, 33% held a bachelor's degree, 19% held a master's degree, and 3% held a doctoral degree.

### Table 1

*Demographic Statistics from the Completed Surveys*

Demographic Statistics	Full Sample	
	<i>n</i>	%
<b>Gender</b>		
Female	20	27
Male	55	73
<b>Age</b>		
18 – 25	6	8
26 – 35	24	32
36 – 45	24	32
46 – 55	13	18
56 – 65	7	9
66+	1	1
<b>Education</b>		
High School Graduate	23	30
Associate's degree	11	15
Bachelor's Degree	25	33
Master's Degree	14	19
Doctorate Degree	2	3
<b>Tenure in the Current Organization</b>		
0 – 5	28	37
6 – 10	36	48
11 – 15	3	4
16 – 20	4	5
21 – 25	2	3
26+	2	3

*Note.* The table represents the demographic statistics of the sample dataset.

Table 2 shows that the skewness and kurtosis for JUCVI and job satisfaction are negative, whereas the turnover intent is positive. The mean score for the JUCVI variable was 5.395 (SD = 0.647). The mean score for the job satisfaction variable was 6.223 (SD = 0.474). Additionally, the mean score for the turnover intent variable was 2.591 (SD = 0.829) among 75 participants.

**Table 2**

*Numerical Summary of JUCVI, Job Satisfaction, and Turnover Intent*

Numerical Summaries					
	M	SD	Skew	Kurt	n
JUCVI	5.395	0.647	-0.171	-0.501	75
Job Satisfaction	6.223	0.474	-0.567	-0.468	75
Turnover Intent	2.591	0.829	0.612	0.225	75

*Note.* Information about the data. Kurt: Kurtosis, M: Mean, n: Frequency counts, SD: Standard deviation, Skew: Skewness, JUCVI: job uncertainty, complexity, variety, interdependency. Where applicable, each number is rounded to three decimal places.

### Reliability Analysis

Table 3 shows that Cronbach's  $\alpha$  value for JUCVI was acceptable ( $\alpha = 0.76$ ); the Turnover Intent Scale was good ( $\alpha = 0.85$ ); and the Job Satisfaction Scale was excellent ( $\alpha = 0.96$ ). Therefore, a reliability analysis was conducted on the JUCVI, turnover intention, and job satisfaction survey instruments. The Cronbach's alpha statistics exceeded 0.70, indicating that the instruments were reliable.

**Table 3**

*Reliability Analysis of the Scales and Their Respective Subscales*

Scales	Item numbers	$\alpha$
JUCVI	1-17	0.76
Turnover Intent	1-6	0.85
Job Satisfaction	1-36	0.96

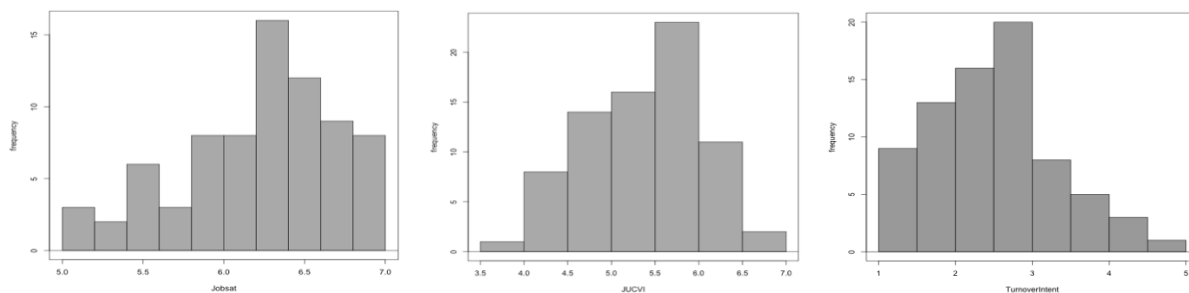
*Note.* Reverse items were coded per the scoring guidelines specific to each instrument. (n = 75).

### Exploratory Data Analysis

Exploratory data analysis (EDA) is used to summarize key features and identify general patterns in the data, including outliers, anomalies, and violations of assumptions underlying tests (Dhummad, 2025). Figure 3 presents histograms of the variables.

**Figure 3**

*The Histogram Frequency Distributions of Variables*



*Note.* Data appears normally distributed. JS variable appears to be skewed to the left.

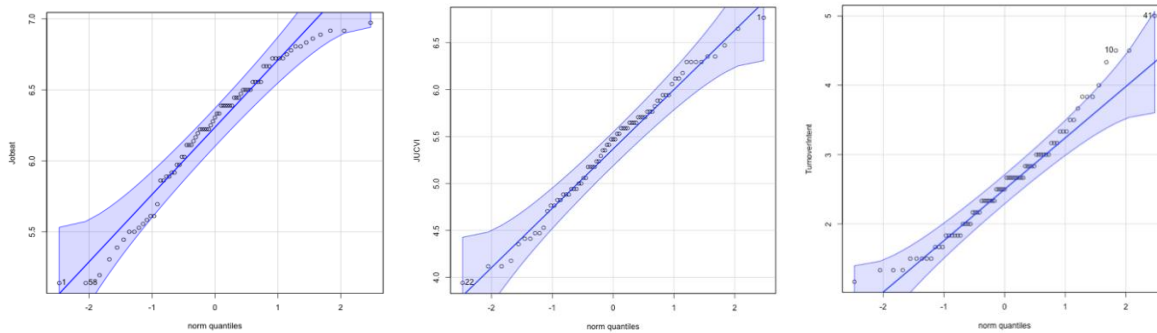
**The Anderson-Darling Test was used to assess the normality assumption for the variables.**

The p-value from the Anderson-Darling Test of Normality for job satisfaction was less than 0.05, indicating that the variable is not normally distributed. Conversely, the p-values for

JUCVI and turnover intent exceeded 0.05, indicating both variables are normally distributed. *The Q-Q Plots (Frequency scores) for the variables are displayed in Figure 4. Data in the shaded area fall within the 95% confidence interval ( $p > 0.05$ ) and are considered normal. Possible outliers have been noted.*

**Figure 4**

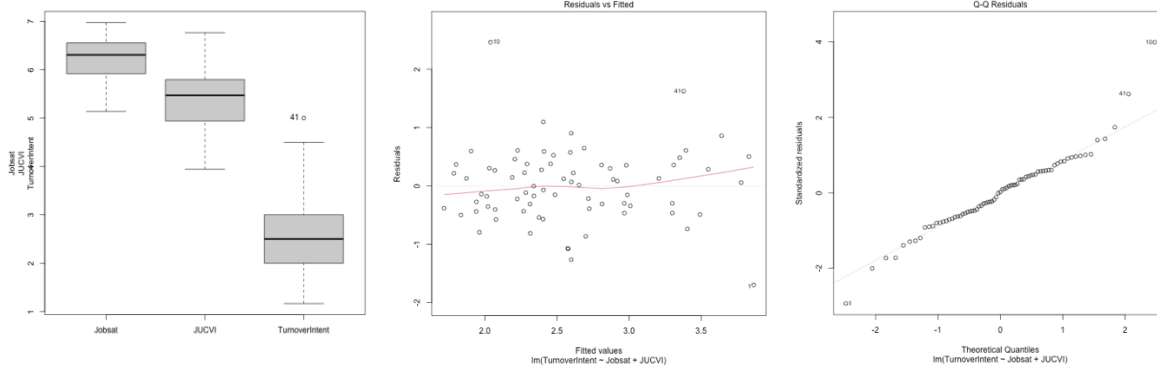
*The Q-Q Residuals Plot of Variables*



*Note. The normal Q-Q plot aligns closely with the diagonal; this suggests that the residuals are approximately normally distributed (Figure 5).*

**Figure 5**

*Boxplots and Residuals Versus Fitted Graphs*



*Note. The boxplots of job satisfaction and JUCVI variables show no outliers; however, the boxplot of the turnover intent variable does. The residuals vs. fitted of Dependent and Independent Variables indicate no pattern. Since the red line is relatively flat, it suggests no discernible non-linear trend in the residuals.*

**Normality Test for the Variable Residuals**

***Anderson-Darling Test for the Normal Distribution***

Table 4 shows the results of the Anderson-Darling (A-D) test for job satisfaction, JUCVI, and turnover intent variables. The Anderson-Darling (A-D) test is one of the most powerful statistical tools for detecting departures from normality and is an adaptation of the Cramér-von

Mises (CVM) test (Sampaio et al., 2024). If the p-value of the A-D test is less than 0.05, H1 is accepted; otherwise, H0 is accepted (Roustaei, 2024; Sampaio et al., 2024). The test result for the job satisfaction variable was significant, with  $A = 1.0102$  ( $p = 0.01095$ ). However, the results for the JUCVI and turnover-intent variables were not statistically significant. For the JUCVI variable,  $A = 0.28913$ ,  $p\text{-value} = 0.6059$ . Additionally, the results for the turnover intent variable are  $A = 0.6153$ ,  $p\text{-value} = 0.1056$ . Therefore, the p-value for job satisfaction did not exceed 0.05 (Table 5), indicating the variable is not normally distributed. Conversely, the p-values for JUCVI and turnover intent exceeded 0.05, indicating both variables are normally distributed.

**Table 4**

*Anderson-Darling Test Normality (n = 75)*

Normality Test		
	A	p-Value
Anderson-Darling		
Job Satisfaction	1.0102	0.01095
JUCVI	0.28913	0.6059
Turnover Intention	0.6153	0.1056

*Note.* JUCVI refers to job uncertainty, complexity, variety, and interdependence.

**Table 5**

*Coefficient of Job Satisfaction and JUCVI (IV)*

	Coefficients			
	Est.	Std. Error	t-Value	p-Value
(Intercept)	9.63733	1.07149	8.994	2.14e-13 ***
Job Satisfaction	-1.14929	0.15834	-7.258	3.68e-10 ***
JUCVI	0.01968	0.11596	0.170	0.866

*Note.* The job satisfaction variable has the most significant impact on turnover intent, with a p-value  $< 0.001$ ; Est: Estimate; Std. Error: Standard Error; IV: Independent variables.

\*\*\* significance of less than 0.001.

## Summary of Findings

A multiple regression analysis was conducted to examine whether a construction manager's job satisfaction and job uncertainty, complexity, variety, and interdependence

(JUCVI) predict their turnover intent. The result of the test was statistically significant:  $F(2,72) = 26.99$  (degrees of freedom),  $p < 0.001$ ,  $R^2 = 0.413$ . Since  $p < 0.001$ , the null hypothesis was rejected. This adjusted R-squared ( $R^2$ ) indicates that 41.3% of the variation in turnover intent is attributable to a construction manager's job satisfaction level, suggesting a moderate level of predictability; the remaining 58.7% is attributable to other latent factors (Roustaei, 2024). A post hoc power analysis in G\*Power indicated an effect size of 0.89. According to Cohen (1988), a correlation coefficient of 0.89 is considered significant.

## Recommendations and Conclusions

To foster a greater sense of support and motivation, the current research contributes to the current understanding by providing researchers with various tools and frameworks, such as leadership style, workload, and stress management, that positively impact construction managers' turnover intentions. Human Resource Managers (HRMs) can better understand construction managers' turnover by allocating time, resources, and materials to discourage their intention to leave the company while also enhancing their job satisfaction.

### Recommendations

Future research on managers in the construction sector should distinguish among managerial roles. This research does not distinguish between the types of managers. Studying manager roles in the construction sector, such as contract manager, project manager, human resource manager, cost manager, supply chain manager, quality control manager, health and safety manager, and commissioning manager, could yield significant contributions to future researchers in the construction field. Specifically, investigating different types of managers will deepen understanding of each manager's needs and inform the tailoring of job-retention strategies accordingly.

Prospective researchers should also consider including categories such as regions of the United States and public, private, or governmental organizations. The study examined construction managers across the United States without distinguishing by region or business type. Future researchers can also employ non-experimental designs to investigate the extent of differences between groups, rather than attempting to infer causality within a study (Schenker & Rumrill, 2004). These new categories will yield significant insights into the impact of JS and JUCVI on TI and help mitigate TI's effects.

Future researchers should use a qualitative study of the lived experiences of construction managers that influence turnover intent. Exploring qualitative research will provide the context and depth that quantitative research cannot capture. Specifically, the researchers will gather personal insights from unique stories, understand the nuances of societal and cultural contexts, and highlight the individual narratives of construction managers, thereby amplifying their voices. Researchers can use interviews and focus groups to collect rich, descriptive data that provide invaluable insights and deepen understanding of construction managers' turnover intentions and how to increase their tenure in the organization.

Additionally, women in construction often do not receive the same level of respect as their male counterparts (Siquaqa & Mzangwa, 2024). Consequently, the researcher recommends that scholars research evidence-based guidelines to promote inclusivity and address gender-based discrimination and harassment (Howe et al., 2024; Siquaqa & Mzangwa, 2024). These recommendations are targeted at team leaders, organizational managers, government regulators,

and external stakeholders. Moreover, these recommendations emphasize raising awareness, providing education, advocating for inclusive and supportive construction job sites, and enhancing job satisfaction among construction workers to reduce the intention to quit among construction managers.

### **Implications of Findings**

To enhance employee retention and engagement in the construction industry, future studies should build upon these findings by examining the intricate relationships between job satisfaction and turnover intent. Longitudinal research that tracks changes over time, along with qualitative methods to understand employee experiences, is recommended.

Future studies can also examine the influence of culture on construction managers across the United States, by region or by business type. Construction companies should implement targeted strategies based on these study findings and provide employee engagement programs, growth opportunities, and a supportive work environment to improve job satisfaction. Organizational leadership can also align compensation packages, including bonuses, with industry trends to effectively reduce turnover.

### **Conclusion**

The primary takeaway from this study is that job uncertainty, complexity, variety, interdependence (JUCVI), and job satisfaction (JS) significantly influence turnover intent (TI) among managers in the U.S. construction industry. The research highlighted the moderate predictive relationship between JS and TI, indicating that improving job satisfaction may help reduce turnover intentions. However, the factors of job uncertainty, complexity, variety, and interdependence were not statistically significant predictors of turnover intent. These findings underscore the importance for construction companies of understanding their managers' specific needs and perceptions, and of investing in measures that promote job satisfaction to retain managers and mitigate the challenges associated with high turnover rates in the industry. By implementing these measures, leadership can mitigate turnover intent, enhance employee engagement, and foster a more stable, productive workforce. Collaborative efforts between academia and industry practitioners can help develop best practices to improve retention and engagement in the construction sector.

### **References**

- Aghimien, L., Aigbavboa, C., & Aghimien, D. (2024). Construction workforce management in the fourth industrial revolution era. *Emerald Publishing Limited*, 11–39. <https://doi.org/10.1108/978-1-83797-018-620241002>
- Alderfer, C. P. (1972). Existence, relatedness, and growth: Human needs in organizational settings. *Journal of Applied Psychology*, 51(6), 509–20
- Ayalp, G. G. (2022). Critical predictors of burnout among civil engineers at construction sites: A structural equation modeling. *Engineering, Construction and Architectural Management*, 29(9), 3547–3573. <https://doi.org/10.1108/ECAM-12-2020-1066>
- Ayodele, O. A., Chang-Richards, Y., & González, V. A. (2022). A framework for addressing construction labor turnover in New Zealand. *Engineering, Construction and Architectural Management*, 29(2), 601–618. <https://doi.org/10.1108/ecam-05-2020-0358>

- Bassett-Jones, N., & Lloyd, G. C. (2005). Does Herzberg's motivation theory have staying power? *Journal of Management Development*, 24(10), 929–943. <https://doi.org/10.1108/02621710510627064>
- Borg, J., & Scott-Young, C. M. (2022). Contributing factors to turnover intentions of early career project management professionals in construction. *Construction Management and Economics*, 40(10), 835–853. <https://doi.org/10.1080/01446193.2022.2110602>
- Borg, J., Scott-Young, C. M., & Borg, N. (2023). Early career project managers' work readiness: Adopting a self-efficacy lens. *International Journal of Project Management*, 41(2), 102454. <https://doi.org/10.1016/j.ijproman.2023.102454>
- Bothma, C. F. C., & Roodt, G. (2013). The validation of the turnover intention scale. *SA Journal of Human Resource Management* 11(1). <http://doi.org/10.4102/sajhrm.v11i1.507>
- Bothma, C. F. C., & Roodt, G. (2013). The validation of the turnover intention scale. *SA Journal of Human Resource Management* 11(1). <http://doi.org/10.4102/sajhrm.v11i1.507>
- Bothma, C. F. C., & Roodt, G. (2013). The validation of the turnover intention scale. *SA Journal of Human Resource Management* 11(1). <http://doi.org/10.4102/sajhrm.v11i1.507>
- Büyükbese, T., Dikbaş, T., Çavuş, Ö., & Asiltürk, A. (2023). Herzberg's two-factor theory and its impact on job satisfaction: A research on bank employees during the COVID-19 period. *Karamanoglu Mehmetbey University Journal of Social & Economic Research*, 25(45), 998–1013.
- Carling, J. (2024). Why do people migrate? Fresh takes on the foundational question of migration studies. *International Migration Review*, 58(4), 1757-1791. <https://doi.org/10.1177/01979183241269445>
- Carter, S. P., Dudley, W., Lyle, D. S., & Smith, J.Z. (2019). Who's the boss? The effect of strong leadership on employee turnover. *Journal of Economic Behavior and Organization*, 159, 323–343. <https://doi.org/10.1016/j.jebo.2018.12.028>
- Cavar, I., Bulian, L., & Dubreta, N. (2023). Exploring work from home: Scale construction and its use in determining Croatian engineers' job satisfaction. *Journal of Information & Organizational Sciences*, 47(1), 83–107. <https://doi.org/10.31341/jios.47.1.5>
- Chang, I.-C., Shiau, W.-M., Lin, C.-Y., & Shih, D.-H. (2023). Consumer intentions to switch on-demand food delivery platforms: A perspective from push-pull-mooring theory. *Journal of Theoretical & Applied Electronic Commerce Research*, 18(4), 2217–2232. <https://doi.org/10.3390/jtaer18040111>
- Chmielewski, M., & Kucker, S. C. (2019). An MTurk crisis? Shifts in data quality and the impact on study results. *Social Psychological and Personality Science*. <https://doi.org/10.1177/1948550619875149>
- Cohen, J. (1988). A power primer. *Psychological Bulletin*, 112, 155–159. <https://doi.org/10.1037/0033-2909.112.1.155>
- De Haas, H. (2021). A theory of migration: The aspirations-capabilities framework. *Comparative Migration Studies*, 9(1), 1-35. <https://doi.org/10.1186/s40878-020-00210-4>
- Dean, J. W., & Snell, S. A. (1991). Integrated manufacturing and job design: Moderating effects of organizational inertia. *Academy of Management Journal*, 34(4), 776–804. <https://doi.org/10.2307/256389>
- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research*, 71(1), 1–27. <https://doi.org/10.3102/00346543071001001>

- Devi, S., Vasudevan, A., Sagadavan, R., & Shiney, J. (2023). Job hopping behavior in the upstream sector of oil and gas industry in Malaysia. *International Journal of Professional Business Review*, 8(10), 1–15. <https://doi.org/10.26668/businessreview/2023.v8i10.725>
- Dhummad, S. (2025). The imperative of exploratory data analysis in machine learning. *Scholars Journal of Engineering and Technology*, 13(01), 30–44. <https://doi.org/10.36347/sjet.2025.v13i01.005>
- Edmondson, D. R., & Matthews, L. M. (2022). How engaged are your employees? Enhancing engagement through autonomy and skill discretion in today's changing environment. *Journal of Marketing Theory & Practice*, 1–13. <https://doi.org/10.1080/10696679.2022.2123348>
- Egemen, M. (2024). Assessing the individual effects of different job satisfaction facets on the job performance of qualified employees in the unique conditions of the construction industry. *Ain Shams Engineering Journal*, 15(7), 102789. <https://doi.org/10.1016/j.asej.2024.102789>
- Ekrot, B., Rank, J., Kock, A., & Gemünden, H. G. (2018). Retaining and satisfying project managers- antecedents and outcomes of project managers' perceived organizational support. *International Journal of Human Resource Management*, 29(12), 1950–1971. <https://doi.org/10.1080/09585192.2016.1255903>
- Fan, X., Wang, D., Wang, F., & Kraimer, M. L. (2024). When leaders are forced to stay: The indirect effects of leaders' reluctant staying on subordinates' performance. *Journal of Organizational Behavior (John Wiley & Sons, Inc.)*, 45(3), 459–476. <https://doi.org/10.1002/job.2743>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Gliner, J. A., Morgan, G. A., & Leech, N. L. (2017). *Research methods in applied settings: An integrated approach to design and analysis* (3rd ed.). Routledge.
- Gomez-Mejia, L. R., Balkin, D. B., & Carson, K. P. (2020). *Managing human resources* (9th ed.). Pearson Education.
- Herzberg, F. (1966). Work and the nature of man. *World*, 290, 339–341.
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The Motivation to Work* (2nd ed.). John Wiley & Sons.
- Hosseini, M. R., Chileshe, N., & Zillante, G. (2014). Investigating the factors associated with job satisfaction of construction workers in South Australia. *Construction Economics and Building*, 14(3), 1–17. <https://doi.org/10.5130/AJCEB.v14i3.4154>
- Howe, A. S., Tan, J., Yuen, B., Saini, H., Saade-Cleves, N., Obeidat, D., Shahzad, M., Chattu, V., Fatemi, A.-B., & Nowrouzi-Kia, B. (2024). Physical and psychosocial correlates of occupational physical injury in the global construction industry: A scoping review. *Environmental Health Insights*, 18. <https://doi.org/10.1177/11786302241270371>
- IBISWorld. (2024). *Construction United States*. <https://www.ibisworld.com/construction-united-states>
- Ivanovic, T., Ivancevic, S., & Maricic, M. (2020). The relationship between recruiter burnout, work engagement, and turnover intention: Evidence from Serbia. *Engineering Economics*, 31(2), 197–210. <https://doi.org/10.5755/j01.ee.31.2.24100>

- Jo, H., & Park, D. H. (2023). A study of user switching intention for ERP systems based on push-pull-mooring model: Focusing on the important role of information quality for users. *PloS One*, *18*(11), e0289483. <https://doi.org/10.1371/journal.pone.0289483>
- Holmberg, C., Sobis, I., & Carlström, E. (2016). Job satisfaction among Swedish mental health nursing staff: A cross-sectional survey. *International Journal of Public Administration*, *39*(6), 429-436. doi:10.1080/01900692.2015.1018432
- Jugdev, K., Mathur, G., & Cook, C. (2018). Linking workplace burnout theories to the project management discipline. *International Journal of Managing Projects in Business*, *11*(1), 198-221. <https://doi.org/10.1108/IJMPB-02-2017-0020>
- Kang, H. (2021). Sample size determination and power analysis using the G\*Power software. *Journal of educational evaluation for health professions*, *18*, 17. <https://doi.org/10.3352/jeehp.2021.18.17>
- Kasa, M., Kichin, S., Hassan, Z., Poh, S., & Ramli, N. (2023). Human resource practices, organizational commitment, and turnover intention among bank employees in Sarawak, Malaysia. *Asian Academy of Management Journal*, *28*(2), 275–307. <https://doi.org/10.21315/aamj2023.28.2.10>
- Kashmoola, B., Ahmad, F., & Yeoh, K. K. (2017). Job satisfaction and intention to leave in SME construction companies of United Arab Emirates (UAE). *Business Management Dynamics*, *7*(3), 1–9.
- Kerdngern, N., & Thanitbenjasith, P. (2017). Influence of contemporary leadership on job satisfaction, organizational commitment, and turnover intention. *International Journal of Engineering Business Management*. <https://doi.org/10.1177/1847979017723173>
- Lee, E. S. (1966). A theory of migration. *Demography*, *3* (1), 47-57. <https://doi.org/10.2307/2060063>
- Lehtonen, E. E., Nokelainen, P., Rintala, H., & Puhakka, I. (2022). Thriving or surviving at work: How are workplace learning opportunities and subjective career success connected with job satisfaction and turnover intention? *Journal of Workplace Learning*, *34*(1), 88–109. <https://doi.org/10.1108/JWL-12-2020-0184>
- Li, T., & Yue, C. (2019). Working with creative leaders: An examination of the relationship between leader and team creativity. *Social Behavior and Personality: an international journal*, *47*(6), 1–12. <https://doi.org/10.2224/sbp.8084>
- Lin, X., & Wu, Z. (2020). An empirical study on the dairy product consumers' intention to adopt the food traceability's technology: Push-pull-mooring model integrated by D&M ISS model and TPB With ITM. *Frontiers in Psychology*, *11*. <https://doi.org/10.3389/fpsyg.2020.612889>
- Lisana, L. (2023). Factors affecting university students switching intention to mobile learning: A push-pull-mooring theory perspective. *Education and Information Technologies* *28*, 5341–5361. <https://doi.org/10.1007/s10639-022-11410-z>
- Liswandi, L., & Muhammad, R. (2023). The association between work-life balance and employee mental health: A systemic review. *Asia Pacific Journal of Health Management*, *18*(3), 263–280. <https://doi.org/10.24083/apjhm.v18i3.2565>
- Locke, E. A., & Latham, G. P. (1990). A theory of goal setting and task performance. Upper Saddle River, NJ: Prentice Hall.
- Longino, C. F., Jr. 1992. "The Forest and the Trees: Micro-Level Considerations in the Study of Geographic Mobility in Old Age." In *Elderly Migration and Population Redistribution*, edited by A. Rogers, 23–34. London: Bellhaven Press.

- Madiistriyatno, H., Wardani, A. K., & Anshori, A. (2023). Qualitative analysis of the relationship of McGregor and Maslow's theory of motivation with employee productivity in Harfiah Laundry. *Journal Return*, 2(12), 1208–1212.
- Maher, J. M., Markey, J. C., & Ebert-May, D. (2013). The other half of the story: Effect size analysis in quantitative research. *CBE—Life Sciences Education*, 12(3), 345–351. <https://doi.org/10.1187/cbe.13-04-0082>
- Marozva, R. R., Barkhuizen, E. N., & Mageza-Mokhethi, M. E. (2024). Factors affecting the retention of millennial academics. *South African Journal of Human Resource Management*, 22(1), NA. <http://dx.doi.org/10.4102/sajhrm.v22i0.2301>
- Maslow, A. H. (1954). *Motivation and personality*. New York: Harper & Row.
- Moon, B. (1995). Paradigms in migration research: Exploring 'moorings' as a schema. *Progress in Human Geography*, 19, 504–524. <https://doi.org/10.1177/030913259501900404>
- Mubarak, N., Khan, J., & Pesämaa, O. (2023). Lord of the flies in project-based organizations: The role of passive leadership on creativity and project success. *Project Management Journal*, 54(5), 508–522. <https://doi.org/10.1177/87569728231157088>
- Munawwarah, M., & Chaerudin, C. (2024). The influence of organizational culture and motivation on performance through job satisfaction as an intervening variable at PT. Idea Creation Warehouse. *Indonesian Journal of Business Analytics*, 4(1), 261–278. <https://doi.org/10.55927/ijba.v4i1.7794>
- National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research*. U.S. Department of Health and Human Services. <https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html>
- Ngoc Luu, T., Phuong Mai, N., Dang, T., & Hien Vu, T. (2022). The impact of internal marketing on employee satisfaction in the Vietnamese telecommunication industry. *Contemporary Economics*, 16(4), 424–442. <https://doi.org/10.5709/ce.1897-9254.492>
- Ozsoy, E. (2019). An empirical test of Herzberg's two-factor motivation theory. *Marketing & Management of Innovations*, 1, 11–20. <https://doi.org/10.21272/mmi.2019.1-01>
- Park, J., Choi, S., Sung, Y., Chung, J., & Choi, S. (2022). Workplace violence against female health managers in the Male-Dominated construction industry. *Annals of Work Exposures and Health*, 66(9), 1224–1230. <https://doi.org/10.1093/annweh/wxac025>
- Ravenstein, E. G. (1889). The laws of migration. *Journal of the Royal Statistical Society* 52, 241–305.
- Robbins, S. P., & Judge, T. A. (2019). *Organizational behavior* (18th ed.). Pearson.
- Roustaei, N. (2024). Application and interpretation of linear-regression analysis. *Medical Hypothesis, Discovery and Innovation in Ophthalmology*, 13(3), 151. <https://doi.org/10.51329/mehdiophthal1506>
- Rumawas, W. (2022). Employees' turnover intention in the construction industry in Indonesia. *Journal of Construction in Developing Countries*, 27(2), 127–146. <https://doi.org/10.21315/jcdc-03-21-0050>
- Ruthankoon, R., & Ogunlana, S. O. (2003). Testing Herzberg's two-factor theory in the Thai construction industry. *Engineering, Construction and Architectural Management*, 10(5), 333–341. <https://doi.org/10.1108/09699980310502946>

- Sampaio, N. S., Mazza, F., De Siqueira, S., Miranda Junior, J., De Abreu, L., & De Lima, R. (2024). Application of the non-parametric signals test to a company. *Social e Ambiental*, 18(2), e04954. <https://doi.org/10.24857/rgsa.v18n2-071>
- Saufi, R. A., Aidara, S., Che Nawi, N. B., Permarupan, P. Y., Binti Zainol, N. R., & Kakar, A. S. (2023). Turnover intention and its antecedents: The mediating role of work–life balance and the moderating role of job opportunity. *Frontiers in Psychology*, 14, 1137945. <https://doi.org/10.3389/fpsyg.2023.1137945>
- Schenker, J. D., & Rumrill, P. D. Jr. (2004). Causal-comparative research designs. *Journal of Vocational Rehabilitation*, 21(3), 117–121. <https://doi.org/10.3233/jvr-2004-00260>
- Serpico, K. (2024). The Belmont Report doesn't need reform, our moral imagination does. *Research Ethics*, 20(3), 559–573. <https://doi.org/10.1177/17470161241235772>
- Siqqa, V., & Mzangwa, T. (2024). Exposure of gender discrimination and sexual harassment among women in the South African construction industry: A case of Or Tambo district municipality. *Journal of Public Administration and Development Alternatives*, 9(s1), 179–192. <https://doi.org/10.55190/jpada.2024.310>
- Spector, P. E. (1985). Measurement of human service staff satisfaction: Development of the job satisfaction survey. *American Journal of Community Psychology*, 13, 693–713.
- Spector, P. E. (1994). *Job satisfaction survey*. <https://paulspector.com/assessmentfiles/jss/jss-english.doc>
- Steers, R. M., Mowday, R. T., & Shapiro, D. L. (2004). Introduction to special topic forum: The future of work motivation theory. *The Academy of Management Review*, 29(3), 379–387. <https://doi.org/10.2307/20159049>
- Uğural, M. N., Giritli, H., & Urbański, M. (2020). Determinants of the turnover intention of construction professionals: A mediation analysis. *Sustainability*, 12(3), 954. <https://doi.org/10.3390/su12030954>
- United States. Bureau of Labor Statistics. (2024a). *Construction managers*. U.S. Dept. of Labor. <https://www.bls.gov/oes/current/oes119021>
- United States. Bureau of Labor Statistics. (2024b). *Business employment dynamics*. U.S. Dept. of Labor. <https://data.bls.gov/>
- Vakira, E., Ndlovu, N., Ncube, C. M., Mporu, B. D., Chirisa, S. B., Mporu, N., Makwelo, S., Ncube, M., & Donga, T. (2023). Antecedents, consequences and managerial retention strategies of employee turnover: A case of Zimbabwe state universities. *British Journal of Management & Marketing Studies*, 6(2), 16–35. <https://doi.org/10.52589/BJMMS-AXSJJ9O9>
- Vaske, J. J., Beaman, J., & Sponarski, C. C. (2017). Rethinking internal consistency in Cronbach's alpha. *Leisure Sciences*, 39(2), 163–173. <https://doi.org/10.1080/01490400.2015.1127189>
- Vroom, V. H. (1964). *Work and Motivation*. New York: Wiley.
- Wang, G., Wang, P., Cao, D., & Luo, X. (2020). Predicting behavioral resistance to BIM implementation in construction projects: an empirical study integrating technology acceptance model and equity theory. *Journal of Civil Engineering and Management*, 26(7), 651–665. <https://doi.org/10.3846/jcem.2020.12325>
- Wiwatowska, E., Czajeczny, D., & Michałowski, J. M. (2022). Decreased preparatory activation and inattention to cues suggest lower activation of proactive cognitive control among high procrastinating students. *Cognitive, Affective & Behavioral Neuroscience*, 22(1), 171–186. <https://doi.org/10.3758/s13415-021-00945-2>

- Wu, G., Hu, Z., & Zheng, J. (2019). Role stress, job burnout, and job performance in construction project managers: The moderating role of career calling. *International Journal of Environmental Research and Public Health*, 16(13).  
<https://doi.org/10.3390/ijerph16132394>
- Xie, L., Luo, Z., & Zhao, X. (2022). Critical factors of construction workers' career promotion: Evidence from Guangzhou city. *Engineering, Construction and Architectural Management*, 30(6), 2334–2359. <https://doi.org/10.1108/ecam-08-2021-0691>
- Yousaf, S. (2020). Dissection of Herzberg's two-factor theory of predicting job satisfaction: Empirical evidence from the telecommunication industry of Pakistan. *The Lahore Journal of Business*, 8(2), 85–128.

## APPENDIX A

### Job Uncertainty, Complexity, Variety, and Interdependence Survey Instrument

Responses are obtained on a 7-point Likert-type scale. The anchors vary and are provided with each item (Dean & Snell, 1991).

#### **Complexity items:**

- How much technical knowledge do the jobs in this unit require?  
o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- To what extent do the jobs involve solving problems?  
o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How complicated are the jobs in this unit?  
o (Anchors are 1 = not at all, 4 = a moderate amount, 7 = very complicated)

#### **Variety items:**

- How much variety in tasks, clients, or things do members of your work unit generally encounter in a working day?  
o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How routine is the work of members in your unit?  
o (Anchors are 1 = not routine, 4 = moderately routine, 7 = very routine) (R)
- How much opportunity do members have in this unit to do a number of different things?  
o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How similar are the tasks members perform in a typical day?  
o (Anchors are 1 = very similar, 4 = moderately different, 7 = very different)
- People in this unit do the same job in the same way most of the time.

- o (Anchors are 1 = completely true, 7 = completely false)
- In doing their jobs from day to day, unit members generally have to adopt different methods or procedures.
- o (Anchors are 1 = completely true, 7 = completely false) (R)
- There are different types or kinds of work to do every day in this job.
- o (Anchors are 1 = completely true, 7 = completely false) (R)

### **Interdependence items:**

- How much do people in this unit have to coordinate work with others?
- o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How often do members start work that is finished by others?
- o (Anchors are 1 = rarely, 4 = occasionally, 7 = frequently)
- How often do members finish work that is started by others?
- o (Anchors are 1 = rarely, 4 = occasionally, 7 = frequently)
- To what extent is dealing with other people part of jobs in this unit?
- o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How often do individuals in this unit work by themselves?
- o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How much does success in this unit depend on cooperation with other people?
- o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)
- How much do people in this unit rely on people in other units?
- o (Anchors are 1 = very little, 4 = a moderate amount, 7 = a great deal)

## **APPENDIX B**

### **Turnover Intention Survey Questionnaire (TIS-6) (Roodt, 2004)**

Key: 1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always

1. How often have you considered leaving your job? .....1 2 3 4 5
2. How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals? ..... 1 2 3 4 5
3. How often do you dream about getting another job that will better suit your personal needs?..... 1 2 3 4 5

Key: 1 = Always 2 = Often 3 = Sometimes 4 = Rarely 5 = Never

4. How often do you look forward to another day at work?..... 1 2 3 4 5

Key: 1 = Very Satisfying 2 = Satisfying 3 = Neither Satisfying nor Dissatisfying 4 = Dissatisfying 5 = Totally Dissatisfying

5. How satisfying is your job in fulfilling your personal needs? .....1 2 3 4 5

Key: 1 = Highly unlikely 2 = Unlikely 3 = Neutral 4 = Likely 5 = Highly Likely

6. How likely are you to accept another job at the same compensation level should it be offered to you?..... 1 2 3 4 5

## **APPENDIX C**

### **Job Satisfaction Survey by Spector (1994)**

<b>JOB SATISFACTION SURVEY</b> Paul E. Spector Department of Psychology University of South Florida <small>Copyright Paul E. Spector 1994. All rights reserved.</small>		
	PLEASE CIRCLE THE ONE NUMBER FOR EACH QUESTION THAT COMES CLOSEST TO REFLECTING YOUR OPINION ABOUT IT.	Disagree very much Disagree moderately Disagree slightly Agree slightly Agree moderately Agree very much
1	I feel I am being paid a fair amount for the work I do.	1 2 3 4 5 6
2	There is really too little chance for promotion on my job.	1 2 3 4 5 6
3	My supervisor is quite competent in doing his/her job.	1 2 3 4 5 6
4	I am not satisfied with the benefits I receive.	1 2 3 4 5 6
5	When I do a good job, I receive the recognition for it that I should receive.	1 2 3 4 5 6
6	Many of our rules and procedures make doing a good job difficult.	1 2 3 4 5 6
7	I like the people I work with.	1 2 3 4 5 6
8	I sometimes feel my job is meaningless.	1 2 3 4 5 6
9	Communications seem good within this organization.	1 2 3 4 5 6
10	Raises are too few and far between.	1 2 3 4 5 6
11	Those who do well on the job stand a fair chance of being promoted.	1 2 3 4 5 6
12	My supervisor is unfair to me.	1 2 3 4 5 6
13	The benefits we receive are as good as most other organizations offer.	1 2 3 4 5 6
14	I do not feel that the work I do is appreciated.	1 2 3 4 5 6
15	My efforts to do a good job are seldom blocked by red tape.	1 2 3 4 5 6
16	I find I have to work harder at my job because of the incompetence of people I work with.	1 2 3 4 5 6
17	I like doing the things I do at work.	1 2 3 4 5 6
18	The goals of this organization are not clear to me.	1 2 3 4 5 6

	PLEASE CIRCLE THE ONE NUMBER FOR EACH QUESTION THAT COMES CLOSEST TO REFLECTING YOUR OPINION ABOUT IT.  Copyright Paul E. Spector 1994, All rights reserved.	Disagree very much	Disagree moderately	Disagree slightly	Agree slightly	Agree moderately	Agree very much
19	I feel unappreciated by the organization when I think about what they pay me.	1	2	3	4	5	6
20	People get ahead as fast here as they do in other places.	1	2	3	4	5	6
21	My supervisor shows too little interest in the feelings of subordinates.	1	2	3	4	5	6
22	The benefit package we have is equitable.	1	2	3	4	5	6
23	There are few rewards for those who work here.	1	2	3	4	5	6
24	I have too much to do at work.	1	2	3	4	5	6
25	I enjoy my coworkers.	1	2	3	4	5	6
26	I often feel that I do not know what is going on with the organization.	1	2	3	4	5	6
27	I feel a sense of pride in doing my job.	1	2	3	4	5	6
28	I feel satisfied with my chances for salary increases.	1	2	3	4	5	6
29	There are benefits we do not have which we should have.	1	2	3	4	5	6
30	I like my supervisor.	1	2	3	4	5	6
31	I have too much paperwork.	1	2	3	4	5	6
32	I don't feel my efforts are rewarded the way they should be.	1	2	3	4	5	6
33	I am satisfied with my chances for promotion.	1	2	3	4	5	6
34	There is too much bickering and fighting at work.	1	2	3	4	5	6
35	My job is enjoyable.	1	2	3	4	5	6
36	Work assignments are not fully explained.	1	2	3	4	5	6