

EXPLORING THE EXTENT OF ORGANIZATIONAL INJUSTICE DIFFERENCE BETWEEN MEN AND WOMEN IN THE U.S. CONSTRUCTION INDUSTRY

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ABSTRACT

Women are among minorities in the American construction industry. According to the Bureau of Labor Statistics, women comprise only 10% of the U.S. construction industry and 9% of the project managers population. There is a dearth of research to assess why this phenomenon exists. Previous research indicate that organizational injustice could explain some of the existing disparities. The goal of this research is to identify the extent of differences of organizational injustice between men and women in the U.S. construction industry. Overall, the results indicate that men and women experience similar extents of organizational injustice. However, the extent of difference was prevalent for resource distribution, salary, and being consulted to improve company performance. In addition, entry level and executive level females perceived more unjust treatment in organizational justice when evaluating relative rewards related to job performance, experience and responsibilities, consultation, decision making, appealing decisions at the workplace, and communication consistency with the upper level leadership.

Keywords: organizational justice, gender differences, American construction industry, organizational behavior, gender equity

INTRODUCTION

In today's construction industry, there is a prevalent disparity amongst men and women in terms of representation, participation in upper management roles, and allocation of resources and salary. The Women's Bureau conducted a survey for nontraditional occupations in 2014 and found that the largest construction career field for women was architecture, where women accounted for only the 25.3 % of the workforce. In contrast, 7.4% of construction managers were female and laborers accounted for less than 1% of the workforce. [1]. While the roots causes of this phenomenon in the U.S. are not studied adequately, research studies in Australia indicate that construction accounted for the third largest industry where women experienced gender discrimination. Approximately 43% of female responders in the construction industry cited gender discrimination [2]. Evaluating the extent of differences of inter-organizational injustice between men and women in the American construction industry is imperative because this measurement can help assess why women are minorities in this field. The goal of this

research is to identify the extent of differences of organizational injustice between men and women in the American construction industry. Additionally, the research will explore if the gender disparities in the construction industry are influenced by the organizational injustices experienced by both genders. Using the theories of organizational justice, an online survey is developed and distributed among construction experts to explore the injustices men and women experience in the American construction industry and identify top organizational injustice experienced by either gender the factors which may influence it.

LITERATURE REVIEW

Organizational justice refers to an employee's experience and perception of fairness at workplace. Organizational justice consists of distributive justice and procedural justice. Distributive justice refers to how resources or rewards are allocated to employees within the same organization. Distributive justice is measured by comparing one employee's treatment with another, which affects an employee's productivity rate [3]. Procedural justice refers to one's reaction to a company's decision making procedures, policies, and processes. An individual may be influenced by if the company is clear, unbiased, transparent, and applies procedures, policies, and processes equally without discrimination.

Organizational justice has evolved from one construct (distributive justice) to additional constructs (procedural justice and interactional justice) over the past 40 years [4]. There is extensive research linked to employees' behavior and attitude based on the perception of organizational justice. Employers' input on organizational justice creates immense impacts on the success and performance of an organization. Employees that experience fairness in the workplace can experience higher productivity, job satisfaction and commitment. In order to diminish organizational injustice, management needs to consider economic (compensation), social (reward and trust), and ethical (equity) factors [5]. Understanding the development of organizational justice is significant to help explore the relationship between organizational justice, its outcome, and gender disparities in the construction-related industries.

Much research regarding organizational justice in the construction industry was conducted in Australia. Men and women in the Australian construction industry were found to experience similar organizational injustices. Researchers Loosemore and Lim utilized theories of organizational justice to assess the extent of injustice in the construction field by issuing an anonymous online survey to Australian contractors, suppliers, contractors, and subcontractors. No real sense of injustice was determined for both genders and evidence of injustices required further investigation [6]. Therefore, this research is still necessary because the study did not analyze the American population and evidence of injustices in this field must still be explored. In addition, a lack of progress in the Australian construction industry was made towards gender equity. Researchers Galea, Loosemore, Powell, and Chappell evaluated how the construction field's design, approach, and procedures affected gender equality through a case study. However, this research served as a basis for a larger research study to assess gender diversity in the Australian construction industry [7]. Opportunities for this research exist as their findings were focused on the Australian market and solely focused on procedural injustices. Furthermore, the same researchers conducted another study in Australia that analyzed that programs and initiatives focused on increasing women participation in the construction industry, the most male-dominated field, instead of addressing gender norms. This research expanded on the previous research findings and identified how the construction industry's procedures may attribute to the women minority in this field [8]. This study identified that women are minorities in this

industry and how procedural justice affects this, yet focused on the Australian population and did not evaluate the injustices that women face the most.

Much research was also conducted in the United Kingdom. Gender equality was evaluated in the United Kingdom construction field, and stereotypes were identified by women in this industry despite accessibility to the profession and social progress in society. Researchers Powell, Dainty, and Bagihole conducted interviews with undergraduate women studying construction-related programs to explore the career making decisions and what factors may influence seeking a career in construction. The researchers concluded that masculine construction stereotypes influenced the female minority in construction [9]. However, this study focused on the United Kingdom's young women demographic and did not measure the extent of difference organizational injustice faced by both men and women. In another study, the authors argued that gender inequality in the construction industry was caused by women's inability to recognize organizational injustices [10]. In this study, the authors only focused on female respondents' perspective, even though both genders were interviewed for this research. In addition, another study was conducted in the United Kingdom and identified that women are capable of performing the same roles as men in the construction industry. However, work culture influenced the lack of women in this industry [11]. Although this research identified factors affecting women's injustices in the construction industry, it did not evaluate the American population. A study done in the United Kingdom construction industry expressed female and ethnic minorities were often under-represented. This study argued that increasing employment gender and ethnic equality and diversity at workplace would benefit the construction industry holistically [12]. Though this study highlighted several recommendations (changes in office culture, company policy and monitor progress) to bridge gender and ethnic employment gap, it did not explore male's perception of organizational injustice.

Finally, previous research has found that workplace gender diversity is influenced by organizational injustice [13]. To form a framework linked with organizational injustice and gender diversity, a study was focused on the gender discrimination and organizational injustice perceived by men and women at workplace in Hong Kong [14]. In this study, the main focus was employees' organizational commitment and job satisfaction, the authors examined workplace organizational injustice perception between men and women in social, cultural and organizational context. Regardless, the progress has been made for gender equity in the workplace, and this study shows discrimination still exists in career progression [15].

Previous studies and research have analyzed gender disparities and determined what may influence females from entering the construction-related industries. However, a comparison between men and women's organizational injustice was not measured. Furthermore, much studies did not analyze the American construction industry, and instead, focused on the United Kingdom or Australian population. This study can help bridge the gap in this sector and provide more information about the extent of difference between both genders in the American construction industry.

RESEARCH METHODOLOGY

Literature review and an online survey are the primary research methods. A confidential online survey was administered to ninety-five construction-related professionals via email and social media. The confidentiality of the online survey is imperative and necessary to acknowledge the sensitivity of this subject matter and to safeguard survey participants' identities when reporting any organizational injustice experiences.

The online survey consists of eighteen closed-ended questions and two open-ended questions. The closed-ended questions are designed to be straightforward to minimize any random errors or inaccurate information interpreted by survey participants. Two open-ended questions at the end of the survey were included to enrich the research's qualitative data. The open-ended questions are utilized as an outlet to encourage the participants to elaborate on any comments or injustices that they may have encountered in the workplace.

Furthermore, the first nine closed-ended questions are structured to classify survey participants' characteristics and background. The participants are asked to specify their gender, age, ethnicity, highest educational qualification, which industry they represent, years of work experience, hours spent per week at work, job title, and finally annual salary range.

Additionally, the remaining nine closed-ended operational questions are designed to measure distributive and procedural injustices. Nine operational questions are comprised of four distributive justice questions, and five procedural justice questions. After reviewing articles about theories of organizational justice, and the operational questions are subsequently adapted from Loosemore and Lim's technique and "concept of intra-organizational justice" [6]. Their research is a basis for this project. Although their results demonstrated that men and women experienced similar organizational injustices at work, their focus was on the Australian population. Therefore, their methodology was applied to the American construction industry. Each survey participant was asked to answer a predetermined response ranging from 1 (strongly disagree) to 5 (strongly agree), commonly known as Likert-type scale. The operational questions are structured to be neutral and to avoid any indication of bias or unfair treatment in the workplace. The questions are to be responded solely from the survey participants' perceptions and personal experiences of organizational justice.

Data and its Treatment

The acquired survey data, from the nine closed-end questions, are ordinal and will undergo quantitative data analysis methods. First, the organizational injustice for each gender will be analyzed with the Relative Prevalence Index (RPI). The computed RPI facilitates the comparisons of each injustice and will provide further knowledge of the prevalence of each injustice experienced by both genders. The RPI method is a normalization calculation that ensures that the relative comparisons of each injustice is not undertaken. The formula for calculating RPI for each injustice is shown in Equation 1:

$$\text{Relative Prevalence Index (RPI)} = \frac{\sum(i \times \text{Frequency})}{(\text{Total number of samples} \times \text{Maximum Rating})} \quad (1)$$

"i" is the value of the Likert-type scale, ranging from 1 to 5. The summation will evaluate the frequency of each reported value. After the RPI is computed for each injustice, then the RPIs for each gender will be compared and the injustices with the highest RPIs will be explored. This will enable the extent of difference to be evaluated. The open-ended question at the end of the survey can be utilized to explore why certain injustices are prevalent [6].

The Wilcoxon-Mann-Whitney non-parametric (WMW) test is an alternative statistical procedure to the traditional two sample t-test. The two sample t-test is the most used hypothesis statistical test to analyze when the means of two samples are the same, and it assumes the questioned variables are normally distributed in the two groups. However, the WMW test is chosen for this research because the data we collected is ordinal, the sample size is smaller and the test does not rely on distributional assumptions. WMW test is a two-sided test that takes each measurement item's observations and rank the observations

in order of size. The sum of the observations ranks is calculated [16]. The formula for calculating (WMW) test for each injustice by gender and job title classification is shown in Equation 2:

Wilcoxon-Mann-Whitney non-parametric (WMW) test =

$$U_1 = R_1 - n_1(n_1 + 1)/2 \quad U_2 = R_2 - n_2(n_2 + 1)/2 \quad (2)$$

$$U = \min(U_1, U_2)$$

U_1 is the observed value for sample 1 (females group), and U_2 is the observed value for sample 2 (males group). n_1 is the sample size for female group, and R_1 is the adjusted sum of ranks. n_2 is the sample size for male group, and R_2 is the adjusted sum of ranks. To determine if the hypothesis is significant, U_1 and U_2 values were compared, then the smaller U -value is selected to compare with U_{crit} value. WMW test enables measuring the extent of difference between the injustices of both genders with the alpha value for two-tailed rho value for the null hypothesis. Furthermore, if the alpha value is small, then the correlation is significant [17]. Values of U_{crit} (p-value) for two-tailed alpha value ($\alpha=0.05$) are given in the Mann-Whitney tables. To examine the null hypothesis in this research, we evaluate each measurement item with the two-tailed alpha value ($< \alpha=0.05$). If the alpha value is < 0.05 , it indicates the hypothesis is significant, and the null hypothesis is refuted.

RESULTS

Relative Prevalence Index

The relative prevalence index (RPI) results are shown in Table I. Overall, both men and women in the American construction industry experienced similar extents of organizational injustices, as the difference in RPI were minimal. The most prevalent differences were found in the procedural justice category. The largest extents of difference in this category were found for being consulted to improve company performance, provided with resources and training to advance his/her career, and hearing employees' concerns before decisions are made.

	Measurement Item	Female RPI	Male RPI	Difference
Distributive Justice	M1 - My responsibilities/ workload is fair	0.71	0.76	0.05
	M2 - My overall rewards in work are fair considering the experience I have	0.71	0.74	0.05
	M3 - My overall rewards in work are fair considering my performance	0.69	0.71	0.02
	M4 - My pay is appropriate given my performance and responsibilities	0.60	0.70	0.1
Procedural Justice	M5 - I am consulted about how to improve company performance	0.59	0.69	0.1
	M6 - I am provided with sufficient resources and training to advance my career	0.64	0.77	0.13
	M7 - Employees' concerns are heard before decisions are made	0.58	0.69	0.11
	M8 - Employees can appeal and challenge management decisions	0.58	0.65	0.07
	M9 - Company culture encourages fairness	0.69	0.78	0.09

Table I - Relative Prevalence Index (RPI) for Organization Justices for Both Females and Males

The largest extent of difference was found if employers provided their employee with sufficient resources and training to enhance his/her career with a RPI difference of 0.13. Most women reported “Neither Agree or Disagree” and “Disagree” while the majority of men stated, “Strongly Agree”. In the optional open-ended question, a female participant commented that a disadvantage at her workplace was that, “The resources at my organization are not allocated evenly”. Furthermore, another female responder stated that a disadvantage of her workplace is the, “lack of time for training” while another stated that “Training, practical courses” can improve her experience at work. Meanwhile, a male participant commented that there are “Plenty of opportunity to learn new technologies and use them” while another male participant stated that there are “plenty of resources for those that want to learn”. The results depict that women do not feel like they are provided adequate resources and training to advance their career, whereas male participants felt that they had the proper training and resources to better their skills.

The second largest difference was in if employees’ concerns are heard before decisions are made, with a difference of 0.11. More women cited “Neither Agree or Disagree” and “Disagree” while more men listed “Agree” that employee’s concerns are heard before decisions are made. However, in the optional open-ended questions, male participants stated that his employer can improve his work experience by, “[providing] more opportunities for staff to interact and grow with one another” and “Generate a more collaborative environment”. Although males agreed that their concerns were heard before decisions were made, they identified that their work experience can be improved if more discussions and collaboration occurred.

The third largest difference was determined to be in if employees were consulted to improve company performance. Females and males reported 0.59 and 0.69, respectively, with a 0.1 difference in RPI. The majority of women disagreed with this statement and did not feel that they were consulted in how to improve company performance. Meanwhile, more males agreed that they were consulted about how to improve company performance.

Wilcoxon-Mann-Whitney Non-Parametric Test

To further assess the extent difference of organizational injustice for each gender, we turn to Wilcoxon-Mann-Whitney non-parametric (WMW) test by analyzing the operational questions for each gender by the management levels. The job titles were categorized into the following four management groups from entry level to upper level: Group A (entry level), Group B (intermediate and senior levels), Group C (lead and senior management levels), and Group D (executive management level). The WMW test results are shown in Table II.

In general, the WMW test statistics results of Group B and Group C did not depict significant difference in organizational justice. Both genders experienced similar organizational justice in the construction industry. Overall, the WMW test analysis depicted a slight difference for lower and executive levels in organizational injustice.

When examining organizational injustice difference between females and males by hierarchical management levels, WMW test statistics findings depicted Group D females experienced more distributive injustice than males when evaluation relative rewards relating to job performance, experience and responsibilities, $\alpha = 0$. In addition, Group A and Group D females experienced more procedural

injustices than males when examining consultation, decision making consistency, and appealing at the workplace, $\alpha = 0$.

The most interesting finding was that entry level and executive level females perceived more unjust treatment in organizational justice when evaluating relative rewards related to job performance, experience and responsibilities, consultation, decision making, appealing decisions at the workplace, and communication consistency with the upper level leadership. Moreover, through this research, female employee ratios were found to be gradually decreased in the upper management levels.

	Measurement Item	WMW	Test Statistics			
			Group A	Group B	Group C	Group D
			16 Females + 9 Males = 25 Total	23 Females + 20 Males = 43 Total	6 Females + 16 Males = 22 Total	1 Female + 4 Males = 5 Total
Distributive Justice	M1	U	56.5	213	39	0.5
		α	0.384	0.696	0.521	0.398
	M2	U	68	222	45	0
		α	0.862	0.846	0.845	0
	M3	U	65.5	218	47	0
		α	0.72	0.77	0.974	0
	M4	U	65	179	38	0
		α	0.693	0.219	0.461	0
Procedural Justice	M5	U	29	217	42.5	1.5
		α	0.012	0.753	0.696	0.398
	M6	U	44	159	40.5	1
		α	0.115	0.073	0.604	0.398
	M7	U	32	207	31.5	0
		α	0.016	0.594	0.261	0
	M8	U	38.5	212	29.5	0
		α	0.049	0.666	0.177	0
	M9	U	48.5	207	28	0.5
		α	0.174	0.594	0.114	0.398

Table II - Wilcoxon-Mann-Whitney (WMW) Test Results for Distributive Justice

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