What Do Construction Workers Really Want? A Study about Representation, Importance, and Perception of US Construction Occupational Rewards

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Abstract: The construction industry in the United States employs thousands of workers in various jobs and accounted for over $645 billion of the US Gross Domestic Product in 2017. Given the reported labor shortage, it has never been more important for the construction industry to have a qualified and motivated workforce. To do so, the industry needs to understand the current status of occupational rewards and how they are being perceived by construction workers. This paper describes research that aims to address this issue by investigating workers' perspectives of occupational rewards in the construction industry. The study utilizes responses from 176 construction workers across different states, different job responsibilities, and different work conditions. The research contributes to the construction industry by providing a unique perspective on occupational rewards through the lens of construction workers. The study identifies the rewards that are available to workers, rewards that are needed by workers, and factors that impact workers' reward satisfaction. By understanding these three aspects of occupational rewards, the industry will have a better chance of attracting and retaining the right workers for the job and motivating the available workforce for the allocated tasks. The study also contributes to the body of knowledge by facilitating a new and holistic view of rewards and the factors influencing rewards in construction. Findings from the research indicate that workers in general, are satisfied with the rewards that they are receiving, where job responsibility was found to be the reward that is received the most. However, workers' needs showed a commonality of financial importance. Furthermore, reward satisfaction was found to be influenced by 11 factors, 8 of which are occupational, and 3 sociodemographic factors. **DOI: 10.1061/(ASCE)CO.1943-7862.0001669.**

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Introduction

Apart from the apparent worker's personal gain in a designed rewarding system that provides workers with what they value in exchange for their efforts, there are important stimuli for the construction industry as a whole to study and improve the personnel reward system in the industry. Among these motivations are (1) attracting workers with the qualifications that match the industry's needs at the requisite time; (2) retaining qualified workers; and (3) motivating workers to contribute and perform at their highest capabilities (Henderson 2003; Kwon and Hein 2013; Shields et al. 2016).

The construction industry, through researchers (Burleson et al. 1998) and practitioners alike (AGC 2017; NAHB 2017), has long expressed concern about a shortage of skilled labor. In 2017, the Associated General Contractors of America (AGC) surveyed over 1,600 construction companies concerning the current status of the industry. Seventy percent of the AGC survey respondents reported that they were "having a hard time filling some hourly craft position"; in the same study, over 35% of respondents reported that they were "having a hard time filling some salaried position" (AGC 2017). Similar responses were obtained in a National Association of Home Builders (NAHB) survey, where the shortages of specific trades ranged from 43% for building maintenance managers to 77% for framing crews (NAHB 2017).

In terms of retaining workers, the AGC report stated that in 2017, 20% of the respondents lost hourly craft professionals (such as carpenters, plumbers, and laborers, among others), and 14% of the respondents lost salary craft professionals to other industries (AGC 2017). The surveyed companies also expected that the labor shortage, as well as the competition for skilled labor, will increase in the future (AGC 2017). It is of vital importance to mention that the shortage of labor combined with the expected surge of construction work demand to rebuild after 2017's two major natural disasters (Hurricanes Harvey and Irma) in two different states may aggravate this problem to a higher level. This issue drove some companies to give signing bonuses to new crews and workers (Paquette 2018; Parsons 2018). That in itself might create a long-term problem for the industry without full understanding of how workers perceive rewards and how such rewards subsequently impact worker safety performance. The impact of rewards on safety is an issue that safety professionals and project managers are dealing with, where research has pointed to the importance of understanding the impact of rewards on a worker's behavior in order for company management to attain a desired outcome (LaBelle 2005).

Finally, the importance of a motivated workforce has been a subject of study for decades. The importance of motivation in

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construction has been acknowledged by researchers, who consider it one of the key factors for preventing accidents, alongside training (Schafer et al. 2008). For this reason, unsurprisingly, various combinations of rewards are provided to workers by their employers in an attempt to satisfy their needs and to motivate them to achieve or compensate them for achieving a specified goal (Hewitt 2012). Although individual factors such as factors related to employee performance (Siegrist et al. 2004), stress management (Schafer et al. 2008), and behavior (Henderson 2003) have been studied to determine their impact on rewards, these factors and others were not studied together. Furthermore, there is a lack of research on occupational rewards in construction and research to identify factors that impact rewards holistically.

Rewarding workers is not an easy task (LaBelle 2005); it is dynamic in nature (Wiley 1997), and its success relies on practice as well as theory (Hewitt-Associates 1991). Rewards are especially important for very physically demanding occupations such as many of those found in the construction industry (Choi 2009), where low levels of reward have a significant negative impact on a worker's well-being (De Jonge et al. 2000). Furthermore, the productivity of a company is highly associated with that company's strategies and personnel (Tabassi and Abu Bakar 2009). Thus, by motivating a company's workforce, a competitive advantage can be gained by the company, and valued rewards and improved well-being can be gained by the company employees (Wiley 1997). With this extent of knowledge in mind, the present study focuses on how the construction industry, specifically field workers, perceive rewards. Such understanding will enable industry practitioners to design a reward system that will help motivate and retain their existing workforce, as well as help attract new workers to the industry.

The study is accomplished through a recently completed survey designed and developed to capture workers' insights regarding their perceptions of what they are receiving, how satisfied they are with the rewards, and the types of rewards they find to be the most important. Furthermore, to capture the underlying factors impacting workers' reward perception, an advanced econometric modeling technique is used. Specifically, an ordered probit modeling framework is utilized to gain a better understanding of how workers perceive rewards. The next section presents a brief overview of reward literature and its evolution, followed by a detailed description of the research methodology and survey design. Finally, survey results and analysis are presented, followed by a discussion of the results, conclusions, limitations, and recommendations.

Literature Review

To understand workers' needs and how to address them, it is important to understand what is meant by rewards. An occupational reward can be anything of value (tangible or intangible) that an employer or an organization delivers to its employees whether intentionally or unintentionally in contemplation of the employee's work contributions (Henderson 2003; Shields et al. 2016), where it is something "to which employees as individuals attach a positive value as a satisfier of certain self-defined needs" (Shields et al. 2016).

An issue of concern with regard to rewards has been inconsistency of interpretation. Kalleberg (1977) categorized reward as intrinsic, convenience, financial, coworkers valuation, career, and resource adequacy. House et al. (1979) categorized perceived rewards into four main types: (1) intrinsic rewards, which include interesting and challenging work; (2) extrinsic rewards, which include fringe benefits and working conditions; (3) importance rewards such as work importance, prestige, and influence; and (4) control rewards, which reflect control over the work pace. Kalleberg and Van Buren (1996) also categorized occupation rewards into four categories: (1) earnings, (2) fringe benefits, (3) promotion opportunities, and (4) autonomy. Siegrist et al. (2004) categorized occupation rewards into three main types: (1) financial, (2) esteem, and (3) career prospects and job stability. Similarly, Kouvonen et al. (2006) organized rewards into three main categories: (1) income and job benefits, (2) recognition and prestige, and (3) personal satisfaction. Lastly, Chiang and Birtch (2008) introduced 10 rewards divided into two categories, financial rewards and nonfinancial rewards. Financial rewards included basic pay, benefits, salary, and incentives (if available). As for nonfinancial rewards, the researchers listed recognition, power, time off, responsibility, training and development, and promotions.

Although researchers are not able to identify the first published paper that presented a study on rewards, research by Herzberg et al. (1959) on the influence of motivating people to work and the hierarchy of needs by Maslow (1970) have had an apparent impact on the rewards identified in the reviewed literature. The hierarchy of needs included five different levels of human needs, which starting from the lowest level of need are (1) physiological, which involves everything the body needs to function; (2) safety, which includes social, economic, and physical well-being; (3) belonging or love needs, which include affection and a sense of belonging to a community; (4) esteem or self-respect that comes from accomplishment and respect from others; and (5) self-actualization, which Maslow associated with creativity and lack of prejudice, among other similar factors. Accordingly, the premise of Maslow's theory was that one need cannot be fulfilled before fulfilling the previous, lower level, prepotent need.

Maslow later refined the theory to be a seven-level hierarchy known as the theory of motivation (Maslow 1970). The refined hierarchy introduced two extra levels: cognitive needs such as curiosity, exploration, and knowledge, and aesthetic needs such as appreciation and beauty. These two additional needs are ranked fifth and sixth, respectively, in the hierarchy, followed only by the need for self-actualization. Maslow also indicated that physiological, safety, belonging, and esteem needs are deficiency needs, meaning that without one of the needs being satisfied, a person would feel as if they are lacking something essential. On the other hand, cognitive, aesthetic, and self-actualization are growth needs associated with a person's desire to grow (Maslow 1970). Importantly, to motivate an employee, a reward that addresses the employee's needs should be provided. Moreover, a reward used for motivation should meet a need that the employee has not already achieved or fulfilled.

In order to narrow the study focus and utilize a contemporary perspective of rewards, the present study adopts the total reward approach as presented by Shields et al. (2016). Under the total reward construct, rewards consist of two main categories: extrinsic and intrinsic. Extrinsic rewards are job-contextual and physically external to the work of the employee. Extrinsic rewards are branched into three types:

- Financial rewards or compensation include base pay, performance-related pay, and cash benefits. Base pay is the fixed component of the compensation, whereas performance-related pay depends on the worker's performance in a particular arrangement. Cash benefits include direct benefits provided by the employer to the employee, such as contributions to a pension or healthcare plan, and childcare.
- Developmental rewards include learning, training, and development; succession planning; career progression; and other career growth rewards.

- Social rewards are nonmonetary indirect benefits that employees receive from their organization that relate to the entity's culture, climate, and performance support, or that promote work group affinity and work-life balance. Other examples can include flexible timing arrangements and fitness and wellness programs.

The second category of rewards is intrinsic rewards. Intrinsic (personal) rewards are provided by the nature of the job at hand. Examples of intrinsic rewards include job challenge, responsibility, task variety, job importance, and autonomy.

The total reward approach provides, in an organized and distinct manner, a clear understanding of rewards where there is no overlap between each category and a clear definition is given for each component. This approach also provides a distinct connection to Maslow's proposed needs (physiological, safety, belonging, esteem, cognitive, aesthetic, and self-actualization), as well as the two-factor theory proposed by Herzberg et al. (1959) in that it contains both motivating and hygiene factors that motivate and satisfy workers. Furthermore, studies have shown direct connection between components of the total reward concept and a company's ability to attract, retain, and motivate their employees (Hewitt 2012; Kwon and Hein 2013).

Although the researchers were not able to find an application of the total reward approach in construction reward research, the approach has been recommended to construction practitioners (CCQ 2017) for salary-paying positions. A Contractor Compensation Quarterly (CCQ) report (CCQ 2017) indicated that salaries are expected to increase by 3.6% on average for superintendents, project engineers, and estimators, along with all positions up to senior management staff. However, the report also mentions that "it's complicated"; salary is not the only motivating factor for employees, and "novel benefits" must be considered by employers also. Remarkably, the scope of the report did not include craft workers. It is of high importance to include the perception of craft workers because they represent a larger portion of the construction workforce and the workers who are physically involved in constructing the work at hand.

The present study focuses on occupational rewards and what workers receive in exchange for their efforts. Performance-related pay and incentives have been addressed in prior construction research and practice for safety and productivity purposes, yet occupational rewards in total have not received similar attention. Furthermore, to the best of the authors' knowledge, there is a general lack of published literature on research regarding what impacts rewards perception; as a result, no literature on this topic has been included herein.

Point of Departure

As seen from the literature review, the significance of rewards is undeniable. Yet, there is a lack of research on this topic as it relates to the construction industry. The present research aims to address this knowledge gap by providing the necessary tools to establish a worker reward system that accounts for and addresses the workers' needs. The outcome of the research will enable creation a worker reward system that is based on perceived value to the employees, which is one of three methods of measuring the total value of compensation, alongside actual cost to the company and actual value to the employee (Hewitt Associates 1991). To do so, the researchers explore rewards representation, importance, and perception from the construction worker's perspective and understanding. These three pieces of information, in combination, will provide industry decision makers with a comprehensive picture of what is essential to motivate workers.

Research Methodology

With the aim of providing a clear understanding of rewards and reward importance, and how rewards and reward importance are being perceived by construction workers, this study presents a comprehensive literature review followed by a survey of construction workers and analysis of the survey results. A comprehensive literature review was conducted to document the variables to be targeted in the survey. The findings of the literature review also guided the development of the survey conducted in the study. The survey was designed and developed to provide an optimal level of confidence for an appropriate sample size. Regarding reward perception, a list of all of the variables selected and corresponding references where the variables are reported is provided.

As mentioned previously, the current literature focuses on the types of rewards available, the needs of workers, and how to improve their motivation through rewards. The present study addresses these issues by answering the following two questions:

- What type of rewards are available for workers in construction?
- What rewards are more important to the workers?

Additionally, as part of the contribution of this study to the body of knowledge, the question of what variables impact workers' perceptions of rewards is examined. This holistic approach to the study necessitates an advanced econometric modeling technique. Therefore, an ordered probit modeling framework is utilized to gain a better understanding of how workers perceive rewards. The ordered probit modeling framework was selected due to the ordinal nature of the response data (Washington et al. 2010). The probit model has been successfully applied to survey data (Kaiser and Spitz 2000; Senik 2005; Anastasopoulos et al. 2012; Hassan et al. 2016; Anderson et al. 2018), as well as to other forms of ordinal data related to transportation safety (Al-Bdairi and Hernandez 2017; Islam and Hernandez 2013).

Empirical Setting

Under the ordered probit model construct, the unobserved variable, y^*, is defined as a linear function of explanatory variables, as seen in Eq. (1) (Greene 2003; Washington et al. 2010):

$$y^* = \beta\chi + \varepsilon \tag{1}$$

where β is a vector of the estimable parameters which corresponds with x; x is a vector of the explanatory variables (e.g., age and marital status, as listed in Table 1); and ε = random disturbance that is assumed to be normally distributed with a mean of 0 and variance of 1.

Using Eq. (2), for each observation, ordinal data y can be represented as follows (Greene 2003; Washington et al. 2010):

$$\begin{aligned} y &= 1 \quad \text{if } y^* \le \mu_0 \\ y &= 2 \quad \text{if } \mu_0 \le y^* \le \mu_1 \\ y &= 3 \quad \text{if } \mu_1 \le y^* \le \mu_2 \\ y &= I \quad \text{if } y^* \ge \mu_{I-1} \end{aligned} \tag{2}$$

where μ = threshold parameter used in the model to estimate the ranking; and I = number of the highest possible ranking of the dependent variable (in this case, up to a value of seven).

Survey Design and Data Collection

With a better understanding of what reward means, the next step was to understand what workers feel they are receiving from working in their construction position, what types of rewards are more

Table 1. Independent variables selected in this study

Category	Variable	References
Sociodemographic	Age	Srour et al. (2006), Hallowell (2010), Rodríguez-Garzón et al. (2014), Shan et al. (2017), and Chen et al. (2017)
	Race	Srour et al. (2006), Shan et al. (2017), Dong et al. (2017), and Fujishiro et al. (2017a)
	Marital status	Hallowell (2010) and Rodríguez-Garzón et al. (2014)
	Number of children	Hallowell (2010) and Rodríguez-Garzón et al. (2014)
	Region	Gangwar and Goodrum (2005), Demirkesen and Arditi (2015), Dong et al. (2017), and Fujishiro et al. (2017b)
Occupational	Years of experience	Srour et al. (2006), Rodríguez-Garzón et al. (2014), and Shan et al. (2017)
	Job title	Srour et al. (2006), Rodríguez-Garzón et al. (2014), Shan et al. (2017), Dong et al. (2017), and Fujishiro et al. (2017a)
	Type of supervision	Wilbur et al. (1994), Frone (1998), Aksorn and Hadikusumo (2008), and Shan et al. (2017)
	Method of payment (salary, per-hour, or per-unit)	Srour et al. (2006), AGC (2017), and Dong et al. (2017)
	Skills and trade	Gomar et al. (2002), Srour et al. (2006), Aksorn and Hadikusumo (2008), Rodríguez-Garzón et al. (2014), Chen and Jin (2015), and Dong et al. (2017)
	Stress	Shan et al. (2017) and Chen et al. (2017)
	Job familiarity	Frone (1998) and Weyman and Clarke (2003)
	Job complexity	Fujishiro et al. (2017a)
	Job satisfaction	Kalleberg (1977), Frone (1998), and Fernández-Muñiz et al. (2012)
	Time with current employer (job tenure)	Hallowell (2010), Chen and Jin (2015), Chen et al. (2017), and Dong et al. (2017)
	Type of employer (e.g., general contractor or subcontractor)	Rodríguez-Garzón et al. (2014) and Chen and Jin (2015)
	Number of projects worked on in the last 3 years	Chen and Jin (2015) and Chen et al. (2017)
	Safety training	Rodríguez-Garzón et al. (2014), Demirkesen and Arditi (2015), Chen et al. (2017), and Dong et al. (2017)
	Accident involvement	Sönmez and Graefe (1998) and Dong et al. (2017)
	Union membership	Srour et al. (2006), Fernández-Muñiz et al. (2012), Demirkesen and Arditi (2015), Shan et al. (2017), and Chen et al. (2017)

important, and how satisfied they are with the rewards received. Thus, the survey was designed and developed to capture a worker's insights through a self-assessment questionnaire. A survey is the most commonly used method for conducting perception studies (Wiley 1997; Visschers and Meertens 2010).

As such, to address the topic needs and to adhere to the suggestions presented in literature, the survey questionnaire was organized into three parts. The first part of the survey asked questions about the worker's sociodemographic information, such as gender, race, and marital status, among others. The second part aimed at capturing the occupational factors that impact the worker's rewards perception. An initial list of potential impacting factors was gathered through an intensive literature review of various studies in various fields. The subsequent "Variable Selection" section provides more details about the factors identified.

The third part of the survey questionnaire was dedicated to rewards. This part involved (1) participating workers' selection of each type of reward, from the total reward approach, that they feel the construction industry offers; (2) the participants' ranking of rewards (financial, developmental, social, and personal) in terms of importance to themselves, where 1 represents the most important reward and 4 represents the least important reward; and (3) an assessment of the participating worker's level of reward satisfaction in which the respondent answers the question by selecting the appropriate rating value using a seven-point scale (from 0 = extremely dissatisfied to 6 = extremely satisfied). To determine the optimal sample size for this study, Eq. (3) was utilized (Lohr 2008)

$$N = \frac{Z^2 p(1-p)}{e^2} \tag{3}$$

where N = estimated sample size; $z = z$-score corresponding to the confidence level; $\rho(1-\rho)$ = response variance; and e = margin of error. For the study, the confidence level selected was 95%; therefore, the z-score was 1.96. The expected value of the variance in responses used here was set as the maximum value (0.5), which is used for more conservative estimates (Lohr 2008). The confidence interval, or the margin of error in the sample estimation selected, was set at 90%. Based on these values and using Eq. (3), the recommended sample size is 97 responses. Similar determination of sample size has been previously utilized and successfully implemented in construction research and in perception research (Tymvios and Gambatese 2016; Faust et al. 2015; Karakhan and Gambatese 2017; Anderson et al. 2018). To increase confidence in the estimates, the researchers aimed to conduct a survey with a sample size twice as large as the number calculated herein.

The study utilized the Qualtrics platform to develop, disseminate, and collect the data. The participation pool included construction workers located across the United States from various sectors in the industry (e.g., industrial, commercial, residential, and maintenance, among others) and who are working for a general contractor, subcontractor, or self-employed. Participation in the survey was voluntary and only for workers age 18 or older. Over 2,000 invitations to participate in the survey were distributed by Qualtrics.

Variable Selection

Due to the lack of existing studies that discuss the underlying factors impacting reward perception, the researchers broadened the scope of variables to be examined. Sociodemographic and occupational factors that impact a person's perception and behavior were included for examination. Table 1 lists all the variables identified

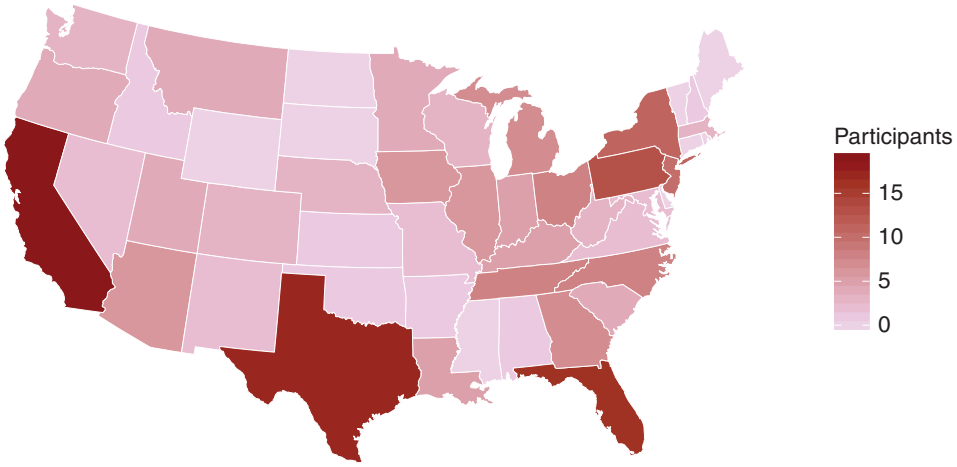

Fig. 1. Survey participation per state.

and selected, accompanied by the list of references documenting the variable as an impacting factor.

Survey Results

A total of 208 construction workers accepted the invitation and participated in the survey. Three recommended quality checks (Vannette 2017) were implemented to validate the data: (1) straightliner elimination, where those who answered multiple questions with the same value are rejected; (2) distraction elimination, where respondents were asked to write a specific word in one of the check questions as an answer; and (3) speeders elimination, where respondents who answered in a third of the median response time or less were also rejected. After inspecting the responses for these three quality control measures, 32 responses were removed from the data set, leaving a total of 176 responses for analysis.

Survey participation was found to be distributed fairly equally across the United States. Approximately 40% of the responding workers are located in the Southern region, and approximately 20% in each of the Northeast, Midwest, and West regions. Fig. 1 illustrates the number of participants by state, where the darker shades indicate a higher number of survey responses.

The average age of the participants was 38.2 years (minimum = 19 and maximum = 63) which is close to the reported national average of 42.5 years as of 2015 (CPWR 2016). The respondents are mainly employed by general contractors (71% of respondents), and the remaining work for subcontractors, are self-employed, or a combination of both. Most of the responding workers are involved mainly in residential construction (45%), with 21% involved in commercial construction, 10% in industrial construction, and the remainder in utility, roadway, or maintenance construction work. The average number of years of experience was 13.8 years (minimum = 1 and maximum = 40), with 24% of the respondents at the level of foreperson or higher, 25% working as crew leaders, and the rest of the respondents working as journeymen, tradesperson, or helpers. Finally, 78% of the respondents are not union members.

Research Question 1: What Rewards Do Construction Workers Receive?

To stay true to the definition of total rewards, the survey participants were asked to indicate which of the total reward approach components they receive while working in construction. A list of potential rewards (described previously and provided in Table 2) was presented to the participants. The participants were also allowed to enter any other types of rewards that they might receive if not listed. The respondents where not asked whether their employer has a designed reward system or not. The survey questions allowed the researchers to capture the rewards that workers receive and the rewards that workers perceive, in addition to the rewards that workers intentionally—or, equally as important, unintentionally—receive from their employers, as mentioned previously in the definition of rewards. The questions were also structured in this manner to be in accordance with Gee and Hanwell (2014)'s remark that what motivates people can be stimulated and encouraged but cannot be produced or commanded.

As indicated in Table 2, rewards representation is not equally spread throughout the four main reward categories. The financial rewards category had the highest presence in the responses, although the remaining rewards categories had nearly the same level of presence. Individually, a clearer picture can be seen as to where worker rewards are absent. In general, it can be seen that workers felt differently about the presence of various rewards even within the same category. The clearest example of this difference is the number of workers who selected responsibility and autonomy. Even though both fall under the personal reward characterization, their presence is quite different. Responsibility is received as a reward by 47% of the workers, the most of all rewards; in contrast, autonomy is received by only 15% of the workers, the least of all rewards excluding the Other type. Financial rewards had the least variance in selection with respect to individual rates, varying between 29.5% and 37.5% of respondents in performance-related pay and fixed pay, respectively. Furthermore, the correlations between the number of rewards indicated in each category and the reward satisfaction indicate that for all categories, the more rewards that the worker receives, the greater the reward satisfaction.

Finally, it is important to discuss that two respondents listed Other rewards in their responses, and the two workers maintained a strong conviction about their reward status, where they indicated that they are extremely satisfied with both their job and their rewards. The rewards that each of the workers indicated were work safety for one responding worker, and variety of locations for the other responding worker. Even though a generalization can be made by relegating that work safety under organization and management culture and a variety of locations can fall under personal rewards, similar to task variety, these two respondents felt strongly about the reward that they had, which led to higher than average job and reward satisfactions. This outcome conforms with Gee and

Table 2. Rewards received by workers ($n = 176$)

Type of reward	Reward description	Number of occurrences (rate of occurrences)	Number of occurrences for at least one reward checked (rate of occurrences)	Correlation between the number of rewards checked in this category and reward satisfaction (p-value)
Financial	Fixed or base pay	66 (0.375)	132 (0.75)	+0.324 (0.0002)
	Cash benefits	60 (0.34)		
	Performance-related pay	52 (0.30)		
Development	Learning, training, and development	64 (0.36)	88 (0.50)	+0.203 (0.0069)
	Succession planning	29 (0.16)		
	Career progression	44 (0.25)		
Social	Organization and management culture	62 (0.35)	102 (0.58)	+0.405 (0.0001)
	Performance support	40 (0.23)		
	Work group affinity	3‘9 (0.22)		
	Work-life balance	46 (0.26)		
Personal	Interesting/challenging work tasks	59 (0.34)	101 (0.57)	+0.283 (0.0026)
	Responsibility	82 (0.47)		
	Autonomy	27 (0.15)		
	Task variety	44 (0.25)		
	Other indirect, noncash benefits	2 (0.01)		

Hanwell's (2014) assertion, as mentioned previously, that rewards can be stimulated but not mandated.

Research Question 2: What Do Construction Workers Want?

For the second part of the rewards analysis and understanding, workers' needs and what they deem to be important are examined. Survey participants were asked to rank rewards (financial, developmental, social, and personal) from 1 to 4 with 1 being the most important reward and 4 being the least important reward. The participants were also allowed to rank more than one reward with the same rank to indicate that two or more rewards are equally important to them. As such, the responses indicate that most of the respondents feel that financial reward is the reward that they want the most, and social rewards is the least important to them. Fig. 2 shows the importance given to each reward by the survey respondents.

Based on Fig. 2, it is clear at the two extreme ends that the most important reward is financial, and the least important reward is social. However, the close and marginal difference between personal and development rewards does not help in understanding a worker's perspective of these rewards relative to each other. It is not surprising that financial reward was cited as the most important reward. A financial reward satisfies the first level in the hierarchy of needs (physical). Also, when the survey participants were asked to indicate whether they receive financial rewards or not, a good portion of them (25%) did not feel that they receive financial rewards.

Regarding personal rewards, responsibility was the single highest ranked type of personal reward by the responding workers. However, autonomy and task variety were not highly ranked personal rewards. Development rewards ranked the highest in the third-most important reward category by 51 of the responding workers, and ranked the second-most important reward by 49 of the responding workers. Compared with development awards, personal rewards were ranked slightly higher for the second-most important reward by 62 of the responding workers.

The outcome with respect to this research question is consistent with existing literature, which has revealed that workers' priority trends toward financial rewards (Wiley 1997). Given that workers' needs and their drivers change over time, the latest round of survey conducted by Wiley (1997) indicated that a shift occurred from interesting work (a personal reward) being the most important to the workers in 1986 to financial reward as the most important reward in 1992. Additional changes may have occurred in the industry since this date.

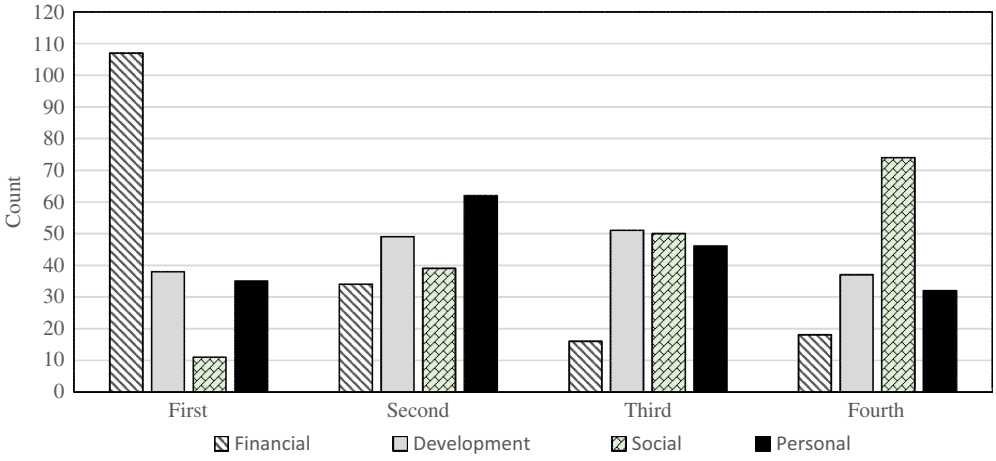

Fig. 2. Reward importance as indicated by respondents.

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Table 3. Estimated result for the best-fit ordered probit model

Independent variables	Reward satisfaction variable				
	Slightly dissatisfied	Neither satisfied nor dissatisfied	Slightly satisfied	Moderately satisfied	Extremely satisfied
Marital status (1 if divorced, widowed, or separated; otherwise = 0)	0.0172	0.1370	0.1459	0.0071	−0.3072
Race (1 if white, otherwise = 0)	−0.0042	−0.0504	−0.0729	−0.0428	0.1703
Region (1 if South, otherwise = 0)	0.0023	0.0321	0.0522	0.0449	−0.1316
Method of payment (1 if per hour, otherwise = 0)	0.0024	0.0376	0.0678	0.0806	−0.1884
Time with current employer (1 if 3 years or more, otherwise = 0)	−0.0033	−0.0437	−0.0695	−0.0580	0.1744
Supervisor job title (1 if foreperson or higher, otherwise = 0)	0.0027	0.0359	0.0571	0.0462	−0.1418
Job satisfaction (1 if low, otherwise = 0)	0.0694	0.2977	0.1984	−0.1148	−0.4507
Accident involvement (1 if witnessed, otherwise = 0)	0.0034	0.0475	0.0788	0.0758	−0.2055
Number of trades (1 if the worker is skilled in two or three trades, otherwise = 0)	−0.0019	−0.0334	−0.0661	−0.0991	0.2005
Stress level (from 1 = very low to 5 = very high)	0.0016	0.0244	0.0416	0.0399	−0.1075
Number of elements in training (0–6)	−0.0008	−0.0116	−0.0197	−0.0189	0.0510

Table 4. Marginal effects of the variables in the best fit ordered probit model

Variable description	Coefficient	T-statistic	*P*-value
Constant	3.71	9.31	<0.0001
Marital status (1 if divorced, widowed, or separated; otherwise = 0)	−0.96	−3.84	0.0001
Race (1 if white, otherwise = 0)	0.47	2.21	0.0270
Region (1 if South, otherwise = 0)	−0.35	−1.89	0.0593
Method of payment (1 if per hour, otherwise = 0)	−0.49	−2.35	0.0187
Time with current employer (1 if 3 years or more, otherwise = 0)	0.47	2.42	0.0156
Supervisor title (1 if foreperson or higher, otherwise = 0)	−0.38	−1.99	0.0471
Job satisfaction (1 if low, otherwise = 0)	−1.71	−6.87	<0.0001
Accident involvement (1 if witnessed, otherwise = 0)	−0.54	−2.85	0.0044
Number of trades (1 if worker is skilled in two or three trades, otherwise = 0)	0.51	1.95	0.0513
Stress level (from 1 = very low to 5 = very high)	−0.28	−2.68	0.0073
Number of elements in training (0–6)	0.13	2.35	0.0186
Threshold parameters			
Threshold 1 Mu(01)	1.19	7.85	<0.0001
Threshold 2 Mu(02)	1.89	15.17	<0.0001
Threshold 3 Mu(03)	3.21	21.18	<0.0001

Note: Model settings: number of variables = 11; number of observations = 176; log likelihood at convergence = −174.011; log likelihood at zero = −229.01; significance level = < 0.00001; and McFadden pseudo R-squared = 0.2402.

Further analysis is needed to help understand how workers' choices can be utilized for designing a reward system because there cannot be a specific reward system for each individual worker. A good starting point might be to conduct a cluster analysis to combine workers into groups based on their needs priority. Dimension-reduction measures have been used when studying rewards. Mannheim (1975), for example, used cluster analysis to reduce 13 types of rewards into four main categories.

Research Question 3: What Impacts a Worker's Reward Perception?

The next step in the study involved a statistical analysis of the underlying variables that impact workers' rewards perception; therefore, a regression model is needed. Given that rewards perception was a measure of satisfaction based on a ranked scale, as is the case of many measures of perception (Visschers and Meertens 2010), from extreme dissatisfaction to extreme satisfaction, an ordered probit model was chosen for the analysis. As such, for the present analysis, workers' rewards satisfaction is the dependent variable, and the variables examined in this study, as listed in Table 1, are the independent variables. An ordered probit model has been successfully implemented in various fields of study when the response variable is in an ordered nature, as mentioned in the "Research Methodology" section.

Estimation Results

After applying the ordered probit model to the sample of responding workers ($n = 176$) with the variables selected previously, nine variables were found to be statistically significant at the 5% level or lower, and two variables were found to be statistically significant at the 10% significance level. A detailed list of all the variables found in the model is provided in Table 3, as well as the model fit and threshold values. Regarding the computed marginal effects, the variable means are listed in Table 4.

For social-demographic factors, three variables were found to be significant, as indicated in Table 3 and the interpretation of the results in Table 4. The three variables are marital status, race, and region. Starting with marital status, respondents who are divorced, widowed, or separated had a 0.307 lower probability of being extremely satisfied in their occupational rewards compared with other workers. This lower level of satisfaction can be attributed to many reasons that might not be directly related to their occupational rewards. Work-life balance (one part of the total reward system) is one factor that might impact the result. This finding concurs

with the results of other studies where, for example, Shan et al. (2017) illustrated that unmarried construction workers are less satisfied with their jobs.

For the second variable, race, workers who identified themselves as being white had a 0.17 higher probability of being extremely satisfied with their occupational rewards. Although only a limited amount of published research is available regarding the effect of race on rewards satisfaction, this finding conforms with existing literature, which emphasizes that race and socioeconomic position are profoundly complex in the United States (Fujishiro et al. 2017a). It is worth mentioning that in their survey of construction workers in 2000, Rowings et al. (1996) found that Hispanic workers, compared with other workers, were more likely to be satisfied in their job. The researchers, however, reported that Hispanic workers had a higher percentage of participation in the study compared with other workers.

The last sociodemographic variable found to be significant was region, where workers from the South have a 0.13 lower probability of being extremely satisfied with their occupational rewards compared with their peers from other regions. Salaries, working conditions, and type of work varies by region. Regarding why workers in the South might have a lower probability of being extremely satisfied, Demirkesen and Arditi (2015) indicated that companies in the southern states often have a safety incentive program that rewards workers who complete safety training. Safety incentive programs have been a controversial topic in construction safety research (Hallowell et al. 2013). Although the diminished effectiveness of incentive programs over time has been addressed (Gangwar and Goodrum 2005; Labelle 2005), their impact on workers' motivation and satisfaction over time should not be overlooked. Safety incentive programs have been found to have a negative impact on satisfaction and motivation, where construction workers, after a lengthy time of receiving safety incentives, felt the incentive to be more of an entitlement rather than an encouragement (Gangwar and Goodrum 2005). The differences in perspectives of incentive programs may be the underlying cause for why workers who receive an incentive might feel differently about their rewards.

For the occupational-related variables, seven of the eight variables were found to be statistically significant at the 95% level. Starting with method of payment, workers who indicated that they are being paid by the hour had a 0.18 lower probability of being extremely satisfied with their rewards. The method of payment variable is, in part, an indicator of job nature and position status. Workers who are at a supervisor or superintendent level are usually paid a salary, whereas crew workers usually get paid by the hour (AGC 2017). The difference in method of payment and the added pay security associated with salary pay might be reasons why workers who are being paid by the hour have a lower probability of being extremely satisfied when compared with their salaried counterparts.

For the time with current employer variable, workers who have worked with the same employer for 3 or more years had a 0.17 higher probability of being extremely satisfied compared with other workers. Job tenure is a big factor in reward and job satisfaction. Workers might feel a sense of value from their employer (Allen and Rush 1998), which in turn satisfies their self-esteem needs. Job tenure might also be seen as a commitment to the employer, for which the workers in turn might be rewarded (Allen and Rush 1998). It is worth mentioning that job tenure, as a variable, has been linked to various aspects of construction worker behavior, such as quality of work-life (Shan et al. 2017) and safety performance (Siu et al. 2003) and is often used as a predictor of accident involvement (Frone 1998; Siu et al. 2003).

With respect to the supervisor job title variable, workers who have a foreperson or higher for a supervisor had a 0.14 lower probability of being extremely satisfied compared with other workers who have other types of supervisors. This finding might be best interpreted when seen with the social rewards of the total rewards approach, which includes work group affinity and quality of supervision in its construct (Shields et al. 2016). Furthermore, peer supervision, on the other hand, might offer reviews, feedback, and insight that higher-level personnel might not offer (Wilbur et al. 1994).

The job satisfaction variable was also found to be statistically significant, where workers who have low job satisfaction had 0.45 lower probability of being extremely satisfied. The lower probability is an expected finding, where workers who feel unsatisfied with their job have a lower chance of being extremely satisfied with their job rewards (Kalleberg 1977).

Regarding workers who have prior experiences being involved in safety accidents, those workers had a 0.20 lower probability of being extremely satisfied when compared with their peers who had not been involved in an accident. Prior experiences have an effect on a person's perception, an impact that Renn (1998) called an anchoring effect. Furthermore, positive experiences of not being hurt lead to a worker's conclusion that the task at hand is safe (Carder and Ragan 2016).

Workers with skills in two or three trades were found to have a 0.20 higher probability of being extremely satisfied with their work compared with their peers who did not have the same number of skills. Multiskilled workers provide extra flexibility to the employer, and for this extra flexibility, they are often compensated with higher pay or longer than average employment (Burleson et al. 1998). Studies have also shown that the number of crafts in which a worker is skilled positively impacts the number of working hours per year (yearly wage), and the rate of pay per hour (hourly wage) (Srour et al. 2006), which in turn indicates, in part, how much a worker with specific skills is being valued by the industry.

In terms of stress, workers with a higher level of stress have a 0.107 lower probability of being extremely satisfied when compared with their peers who have a lower level of stress. This finding conforms to the norms of any job, where stressed workers are less likely to be happy in their job given that the stress is linked to job pressure (Fernández-Muñiz et al. 2012). Margolis et al. (1974) considered work stress as an unrecorded occupational hazard, and De Jonge et al. (2000) considered stress to be, to an extent, a measure of well-being.

For this variable, survey participants were asked to select which of the following elements their training contains: (1) training in the worker's own language, (2) visual aids used in training, (3) feedback is provided for workers, (4) middle management personnel participate in training, (5) content of training is designed to satisfy worker's need, (6) motivation of workers through frequent meetings, and (7) none of the above. These six elements have been found to be the most effective elements and reinforce learning in training construction workers (Demirkesen and Arditi 2015). As indicated in Table 4, training impacted rewards perception positively, where workers who had training that was more inclusive, meaning more of the aforementioned elements, had a 0.05 higher probability of being extremely satisfied. This result is expected because training is already considered part of the total reward approach, as mentioned previously. The impact of training on rewards has been documented (Sims et al. 1976). Furthermore, the impact of training has also been documented in construction workers' risk perception in multiple studies (Rodríguez-Garzón et al. 2014; Demirkesen and Arditi 2015).

Lastly, both region and skill level variables were found to be not statically significant at the 95% confidence interval, yet they were close enough that the researchers included them in the table because of their practical significance.

Discussion

In this study, construction workers revealed that the industry offers a variety of rewards in return for their work, although their needs are not yet fulfilled. It is very important to remember that offering rewards should not solely be a matter of quantity; it is also a very delicate balance of what is offered and what is desired. Therefore, it is only fitting that the received rewards should be discussed in conjunction with the important rewards.

With regard to what rewards are being offered, job responsibility is the reward that is received most often (received by 47% of respondents), and succession planning and autonomy are received by 16% and 15% of all workers, respectively. As a reward category, developmental rewards are received by workers the least often (received by 50% of respondents), whereas personal rewards and social rewards are received by 57% and 58% of the workers, respectively. Consequently, although autonomy, a personal reward, might be important to workers, career progression, a developmental reward, should be addressed first given the rate in which the category of rewards is received and its level within Maslow's hierarchy of needs. Learning and progression may be considered to be at the esteem and cognitive level of needs, whereas autonomy and interesting work would be at the aesthetic needs level. Kwon and Hein (2013) described that succession planning is among the most important factor in both retaining workers and engaging employees, and autonomy was listed among the most important factors in attracting new employees. Such a decision should be made according to a worker's needs, where a closer look at the outcome of the reward importance question, shown in Fig. 2, reveals that developmental rewards are at a higher need level compared with personal rewards.

Similar consideration should be made with regards to improving financial versus nonfinancial rewards. Even if financial rewards are predominantly identified as the most important reward, striking a balance between financial and nonfinancial rewards is crucial in framing a reward system (Shields et al. 2016). Financial rewards provide satisfaction, as indicated by Herzberg et al. (1959), but other rewards offer motivation. It is clear from the workers' responses that although they are satisfied with their rewards for now, they still have needs that should be addressed. Improving workers' motivation should be the main goal of future research.

With regard to how rewards should be offered, the researchers would like to express the importance of the implications of rewards and the way workers receive the rewards. Rewarding workers for a certain performance aspect might show unintentional encouragement for other, unintended behavior. This result implies that rewarding workers for better production and/or safety implications of rewards should not be forgotten, especially in light of the effect that flexibility, as reported by the respondents in the South region, has on reward perception. As such, reward design should not be conducted in a vacuum absent of other factors that might be impacted by its adjustment, or by reward administration. Among the impacted factors, those that should be considered are productivity, safety, effort, and behavior.

Further study is needed to better understand the multidimensional implications of rewards on worker behavior. The researchers that recommend training and developmental rewards are noncontingent for their benefits in improving worker satisfaction as well as increasing the worker's ability to perform required tasks.

An important reason underlying why most workers choose financial rewards as the most important reward may be due to their wages and how the wages have changed, if any, over the years. Looking at entry-level construction positions, such as a laborer, the wages have not changed significantly from 1997 to 2016. Without adjusting for inflation, in 1997, the mean helper wage was \$14.77 per hour; in 2006, the mean hourly wage was \$14.39 (median was \$12.66); and in 2016, the mean hourly wage was \$18.22 (median was \$15.49) (BLS 1998, 2007, 2017b). For all employees in construction, the mean hourly wage increased from \$23.43 in 2006 to \$28.40 in 2016, adjusted seasonally (BLS 2017a). On a positive note, the no-change/slow growth in hourly wages might be one of the main reasons why construction workers stayed in the industry during the recession (Daly et al. 2012). The Federal Reserve Bank of San Francisco (FRBSF) did not mention the impact on the overall workers' income during the recession because their hourly wage may have stayed the same but the number of working hours may have changed (e.g., decreased). Furthermore, the FRBSF ha estimated that workers' hourly wages will not change (Daly et al. 2012).

Regarding the underlining factors impacting workers' rewards perception, the factors can be divided into two groups based on the capability of the factors being improved by the employer: improvable and nonimprovable. Improvable factors are those that the employer can affect, and include time with current employer, type of supervision, job satisfaction, accident involvement, skill level, stress level, and training comprehensiveness. Although changes to each of these factors cannot be made overnight, the changes are possible. Employers can improve their workers' benefits to increase workers' rewards satisfaction and improve workers' health beyond their on-site work hours. Coincidentally, those factors are a subset of the NIOSH Total Workers Health approach (NIOSH 2016).

Strikingly, safety, and risk in general, has been linked in many ways to rewards more than one time throughout this study. This link is at both the surface level where workers' motivation and training contributes to accident prevention (Schafer et al. 2008), and at a deeper level where accident involvement, training, stress, and use of incentives impacts both safety and rewards perception. Thus, safety implications cannot be overlooked.

Regarding the second group of factors, the nonimprovable ones, these factors are those that an employer has no or little control over, and include marital status, race, region, and method of payment. The first three factors are sociodemographic factors, and even if they are statistically significant in their impact on reward satisfaction, changing them is still out of the employer's hands. Although method of payment as a factor that can be changed from by the hour to another method of payment (e.g., salary), the researchers consider this factor as a reflection of the nature of the job/position of the worker and the industry as a whole. Therefore, changing this factor just to improve reward satisfaction is likely not feasible. For example, not all workers should be paid in the same manner as supervisors. Moreover, the change in job nature needs a set of skills and experience that would not be achieved by a lower level worker and would likely not be possible given the industry structure.

It should be kept in mind that what motivates people changes over time, and even the most motivated employee can be discouraged and unfulfilled at some point (Gee and Hanwell 2014). Therefore, to ensure that a reward system adequately addresses their employees' needs, employers must regularly conduct surveys of their employees' needs and desires to address this issue (Wiley 1997). Finally, measures should be taken to improve workers'

rewards because an employer's commitment to its workforce has been confirmed as a boost of reputation to prospective employees and provides a viable advantage in attracting high-quality employees (Turban and Greening 1997). Other measures that can be used to attract new workers to the industry and that are highly connected with rewards are paid vocational training and apprenticeships. Presently, the United States falls behind Europe, where this approach has proven its effectiveness in attracting and developing a more highly skilled workforce (Harhoff and Kane 1993; Dionisius et al. 2009).

Conclusions

Occupational rewards play an important part in motivating, retaining, and attracting workers to an industry. In this study of rewards, three aspects of rewards were examined: what rewards construction workers have, what rewards they want, and what factors impact their rewards perception. These three aspects provide information to establish construction workers' rewards perception that is based on the perceived value to the employee.

The study contributes to the body of knowledge by providing a clear representation of the occupational rewards as perceived by workers. The results indicate that as a group of rewards, financial rewards is the group most received by workers in the construction industry. As an individual reward, responsibility is the most received reward. Conversely, career planning and work autonomy are the two least received rewards in construction.

Reward importance, a reflection of the workers' need for financial, developmental, social, and personal rewards, was also investigated. The findings show that, generally, the rank of reward importance by the responding workers from most to least is financial, personal, developmental, and social.

Lastly, the study provided a deeper understanding of how occupational factors, as well as sociodemographic factors, impact reward perception for both increasing and decreasing the probability of workers being extremely satisfied. The interpretations of impacts were discussed, and variables were also grouped by the possibility of improvement in order to provide a more useful path to intervention by employers. The study findings help future researchers as well as employers in understanding how each category of the total reward approach is represented and provided in the industry, how to address workers' needs, and how each factor impacts rewards perception.

Limitations

Although this research contributes greatly to the body of knowledge, it is not without limitations. The limitations bound the generalizability of the results to other populations and indicate areas of future work. First, during the sample size calculation, the margin of error chosen was 0.1, which gives a level of confidence of 90%. Although the researchers believe that this margin of error is adequate, not to mention that it has been used successfully in similar studies, it should be mentioned as a limitation. Second, variation within survey data due to individual unobservable factors (unobserved heterogeneity) on reward perception was not accounted for during the development of the ordered probit model. Future work should account for the variance by using a random parameter model or latent class model. Third, given that a worker's needs and perceptions change over time, prediction of future behavior cannot be made for the long term. Nevertheless, over the short term, the findings of the study should hold true. Finally, to be able to reach workers across all of the states, and to maintain participant anonymity, an online survey questionnaire was utilized. Thus, validation of what workers actually receive in their occupation cannot be conducted. Responses and measures were based on a worker's judgements with respect to their job.

Recommendations and Future Work

For future studies, the researchers recommend constructing a dynamic reward system that not only considers the nature of each type of reward, but also the impact of time on satisfaction. The researchers suggest utilizing the Kano model for this task (Matzler et al. 2004). Also, when designing a worker reward system, and given that this study was limited to one measure of satisfaction for all rewards, the researchers suggest clustering reward importance for each category (financial, social, developmental, and personal) as well as the corresponding reward satisfaction measure for a better representation of a worker's assessment.

Data Availability Statement

Data generated or analyzed during the study are available from the corresponding author by request. Information about the *Journal*'s data-sharing policy can be found here: http://ascelibrary.org/doi/10.1061/(ASCE)CO.1943-7862.0001263.

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