

Differences in the Human Dimensions of Specialty Field Leaders and General Contractor Project Managers

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Human Dimensions Differences Between Job Roles for Specialty Field Leaders and General Contractor Project Managers

ABSTRACT

The shortage of workforce in the construction industry has placed a demand on engineering and construction firms to attract and retain even more workers. The competition for qualified skilled workers within the construction sector and from other industries has impacted the labor turnover in the industry. The repeated cycle of training new hires due to labor turnover may affect organizational and project performance. Construction firms should seek tactical human resources initiatives to attract new hires, develop old hires' skills, and retain talent in their workforce. This study investigates the differences in human dimensions of individuals engaged on construction job sites. The aim of this paper is to identify distinctive human dimensions of skilled trades workers, essentially required for job transition within the construction industry. This study adopted HEXACO personality inventory, Emotional Intelligence, and Q-DiSC behavioral diagnostics to determine personality trait differences and peculiarities between 133 project managers working for general contracting firms and 88 Specialty field leaders in the Sheet Metal and Air Conditioning trades. The data collected from the 221 construction professionals were analyzed using the independent t-test to evaluate the statistically significant differences in the means of personality traits between the groups. Sincerity, Fairness, Greed-Avoidance, Fearfulness, Prudence, Inquisitiveness, and Social Awareness, among other measures, were significantly different between the groups. The differences recognized between the groups in this study can afford employees a better perspective of the traits common to the new jobs for smooth job role transition within the construction sector.

Human Factors, Specialty Trades, Project Managers, Talent Development, Personality Traits

INTRODUCTION

In the construction industry, construction processes are complex and involve interdependent activities that require the collaboration of various stakeholders and project teams. Despite the importance of the workers, the current shortage in the workforce has been a problem inhibiting the productivity of the sector [6] [8] [9] [11]. One major contributor to the labor shortage in the US construction industry is the retirement of many members of the baby boomer generation [2]. Retiring construction workers will continue to contribute to the worker shortage, as indicated by the fact that in 2020, 23.9% of construction workers were at least 55 years old [5]. Further contributing to the worker shortage is the increase in construction expenditures and the number of projects due to the Bipartisan infrastructural bill passed in the United States. Onshoring manufacturing facilities- the movement of factory operations from foreign countries back to the US, will also increase the demand for construction projects in the country. With the expected increase in projects and the aging population of the current workforce, the challenges associated with the shortfall in the workforce population could be aggravated. Competition for the best talents from a workforce that seems inadequate to meet up with the current demand is a possible resultant effect of the projected growth in the industry and individual companies' needs. The labor shortage

and competition to recruit skilled employees may contribute to workers' decision to transition to different job roles in the industry.

These challenges make it important for construction companies to apply effective strategies to recruit, train, and retain employees. One beneficial strategy involves assessing workers' technical and soft skills and determining whether they align with the job requirements. Previous studies (e.g., [7], [13]) have found that personality traits are associated with skills that influence job performance. The objective of this study was to identify the personality traits, or human dimensions (HDs), of specialty field leaders and general contractor project managers, and determine whether specialty field leaders have the traits needed to be effective as project managers in general contractor firms.

LITERATURE REVIEW

In the construction industry, employees' performance significantly contributes to the overall success of projects and construction organizations. Therefore, employers need to recruit skilled workers and provide targeted training to workers in order to achieve the desired project outcomes and organizational goals. To effectively recruit and train workers, construction companies should first determine what traits and skills help workers succeed in their jobs, especially construction project management jobs.

Beyond technical competence, [1] and [14] noted that personality characteristics are essential for the job performance of construction workers. According to [3], personality traits are largely responsible for the values, behavior, motivation, and perception of individuals. This suggests that personality characteristics and traits influence why people are the way they are. [15] found that specific personality traits are correlated with specific behavioral patterns. These findings further support the need to rightly match potential hires' technical expertise and personality traits with job requirements [7].

The construction industry thrives on the collective efforts of different stakeholders. The effective coordination of the inter- and intra-organization relationships and activities of team members is critical for project delivery. [17] reported that project success is contingent upon the capabilities, knowledge, and skills of team members. Research indicates that soft skills in the following areas are needed to effectively manage construction projects: teamwork, leadership, communication, conflict management, motivation, and trust building [10] [16].

Some of these soft skills are correlated with personality traits in past studies. Using the Big Five personality assessment model, [7] discovered that project managers that had the openness to experience and conscientiousness traits possess the inborn abilities to be good leaders, do not only demonstrate concern for projects but would take corresponding actions to ensure project goals are achieved. [13]'s study compared the personality traits of construction workers using the HEXACO Personality Model. The study found that field leaders had lower inquisitiveness than estimators, and are inclined to focus on getting work done, have little interest in understanding why the processes involved are the way they are.

In the bid to combat the challenges that come with the labor shortage, employers have begun to adopt personality assessment tests in the recruitment process. Using personality assessments in the recruitment process can help construction companies evaluate whether an applicant is likely to succeed in a job. Hiring the individuals who are most likely to succeed can improve organizational productivity and performance [1]. [4] suggested that construction companies can also use personality assessments to identify skills that existing workers lack and then provide training to address the deficiencies; by doing so, companies can reduce employee turnover. Promotion and recruitment of skilled workers from specialty trades to fill managerial positions have become commonplace in general contracting firms (Bigelow *et al* 2019). Given these developments, there are limited studies that have investigated the personality traits for job transition within supervisory roles in construction companies.

METHODOLOGY

Data Collection

A web-administered questionnaire survey was used to collect data regarding the personality traits of 133 General Contractor project managers and 88 Specialty field leaders (Sheet Metal and Air Conditioning Contractors).

For this study, project managers were considered to be construction personnel responsible for contract administration and performance of awarded projects. Field leaders were considered to be personnel who drive site outcomes and work closely with the project manager to ensure the timely delivery of the tools, information, and materials needed to support construction work on-site. Field leaders include foremen, site superintendents, and employees with similar job titles.

Table 1: Number of Participants by Job Role

Job Roles	Number of Participants
Specialty Field Leaders	88
General Contractor Project Managers	133
Total	221

Assessment Tools Used in this Study

The survey contained 112 questions, which came from the HEXACO Personality Inventory, the Emotional Intelligence Diagnostic, and the Q-DiSC 101 Behavioral Assessment. These assessments are described in the following sections.

HEXACO Personality Inventory

The assessment was developed by [12]. It consists of 60 questions; responses measured on a scale of 1 to 5, ranging from strong agreement to strong disagreement with the statements/questions provided. The inventory categorizes personality into six major domains, and each domain is divided into four subdomains:

- Honesty-Humility (H): This domain contains the sub-domains of Sincerity, Fairness, Greed Avoidance, and Modesty.

- Emotionality (E): This domain contains the sub-domains of Fearfulness, Anxiety, Dependence, and Sentimentality.
- Extraversion (X): This domain contains the sub-domains of Social Self-Esteem, Social Boldness, Sociability, and Liveliness.
- Agreeableness (A): This domain contains the sub-domains of Forgiveness, Gentleness, Flexibility, and Patience.
- Conscientiousness (C): This domain contains the sub-domains of Organization, Diligence, Perfectionism, and Prudence.
- Openness to Experience (O): This domain contains the sub-domains of Aesthetic Appreciation, Inquisitiveness, Creativity, and Unconventionality.

Emotional Intelligence Diagnostics

This assessment contains 28 items designed to examine individuals' abilities to recognize and manage their and other people's emotions. An individual's responses are used to calculate an Emotional Intelligence Quotient (EQ) ranging from 1 to 100. The diagnostic also assesses an individual's emotional intelligence in four key areas:

- Self-Awareness (SEA): This construct regards a person's ability to understand his or her emotions as they happen.
- Self-Management (SM): This construct regards a person's ability to control his or her emotional reactions.
- Social Awareness (SOA): This construct regards a person's ability to understand the emotions of other people.
- Relationship Management (RA): This construct regards a person's ability to successfully manage interactions through awareness of his or her emotions and the emotions of other people.

Q-DiSC 101 Behavioral Assessment

This is a four-quadrant profiling tool developed by Dr. Avi Wiezel. It categorizes behavior into four groups and two subscales. The subscales provided information about the work orientation and communication styles of the participants. It contains 24 questions in each of the four groups listed below, measured with a scale of -4 to 4.

- Dominance (D): This category is associated with control, power, and assertiveness. Actions are focused on accomplishing results.
- Influence (I): This category is associated with social interaction and communication. Actions are focused on building relationships and persuading others.
- Steadiness (S): This category is associated with stability, patience, resilience, and thoughtfulness. Actions are focused on compliance and cooperation.
- Compliance/Conscientious (C): This category is associated with structure and organization. Actions are focused on preciseness and tactfulness.

DATA ANALYSIS

The data were analyzed using independent t-test to compare the mean HD factor scores for specialty field leaders and general contractor project managers, using 90%, 95%, and 99%

confidence intervals. The test was also performed to determine the specific HD factor scores that were statistically different between the groups. In addition, descriptive analysis and percentage difference of significant results were performed for result interpretation.

RESULTS AND DISCUSSION

Differences in Mean HD Factor Scores for Specialty Field Leaders and General Contractor Project Managers

The statistical analysis indicates that specialty field leaders' and general contractor project managers' scores differed regarding all HD factors from the HEXACO Personality Inventory except for the Extraversion domain. In terms of the HD factors from the Emotional Intelligence Diagnostic, Self-Awareness, and Social Awareness were the factors with a statistically significant difference in the scores of field specialty leaders and general contractor project managers. Regarding the HD factors from the Q-DiSC 101 Behavioral Diagnostic, field specialty leaders' and general contractor project managers' scores were significantly different for Work Orientation and Communication Style. Table 2 shows the HD factors for which the field specialty leaders' and general contractor project managers' scores differed to a statistically significant degree.

Table 2: HD Factors Differences Between Specialty Field Leaders and General Contractors Project Managers

Domain/Category	HD Factor	Mean Difference	Percentage Difference
Honesty-Humility	Sincerity	0.2723***	+7%
	Fairness	-0.3265***	-8%
	Greed-Avoidance	0.1680*	+5%
	Modesty	0.3801***	+10%
	New-Honesty/Humility	0.1221**	+3%
Emotionality	Fearfulness	-0.2931***	-12%
	Dependence	-0.5745***	-24%
	Sentimentality	-0.2467**	-8%
	New-Emotionality	-0.2643***	-10%
Agreeableness	Forgiveness	0.4752***	+16%
	Flexibility	0.1624*	+5%
	Patience	0.4955***	+15%
	New-Agreeableness	0.2808***	+9%
Conscientiousness	Organization	0.4257***	+11%
	Diligence	0.1971***	+5%
	Perfectionism	0.3069***	+8%
	Prudence	0.1588**	+4%
	New-Conscientiousness	0.2721***	+7%
Openness to Experience	Inquisitiveness	-0.7155***	-21%
	New-Openness to Experience	-0.1753**	-5%
Emotional Intelligence	Self-Awareness	2.4932*	+3%

Q-DISC 101	Social Awareness	7.8512***	+11%
	Overall EQ	3.1865***	+4%
	People	0.5479***	+398%
	Reserved	0.54785**	+93%
	Q-DISC 101	2.3331***	+17%

Note that the mean difference is FL- GC PM

** Significant difference at 90% Confidence Interval*

*** Significant difference at 95% Confidence Interval*

**** Significant difference at 99% Confidence Interval*

Specialty Field Leaders' Higher Mean HD Factor Scores

Compared to the general contractor project managers, the specialty field leaders had higher mean scores in Sincerity (7% higher), Greed-Avoidance (5% higher), and Modesty (10% higher) in Honesty-Humility Domain. Specialty field leaders' higher scores for these factors suggest that specialty field leaders are more unassuming, more straightforward when interacting with other people [12], more likely to think of themselves as ordinary team members rather than as team leads, and less likely to expect preferential treatment. A specialty field leader with these traits who transitions to the role of a general contractor project manager will likely need to modify some of these traits because project managers are expected to be authoritative figures in the decision-making process and oversee and delegate tasks.

The specialty field leaders' mean score for Agreeableness was 9% higher than the general contractor project managers' mean score. Within the Agreeableness domain, the field leaders' mean score for Forgiveness was 16% higher than the mean score for general contractor project managers, and the field leaders' mean score for Flexibility and Patience was 5% and 15% higher respectively. High scores in these subdomains indicate that individuals are able to trust others even after being treated badly and are able to remain calm when angry [12]. Therefore, specialty field leaders with these traits may be better able to move past grudges against other workers and collaborate with them and others to achieve present and future project objectives.

The specialty field leaders also had higher scores for the Conscientiousness domain (7% higher) and for the subdomains of Organization (11% higher), Diligence (5% higher), Perfectionism (8% higher), and Prudence (4% higher). These findings indicate that specialty field leaders are more likely to keep things orderly, apply a structured approach to completing tasks, be hardworking, and be meticulous, and thorough with details [12]. These qualities help individuals to effectively manage and deliver construction projects; therefore, specialty field leaders who have high scores for Conscientiousness, Organization, Diligence, and Perfectionism, and Prudence may be well positioned to excel as generator contractor project managers.

Specialty field leaders had a relatively high mean score for Overall Emotional Intelligence, and this score was 4% higher than the mean score for general contractor project managers. Further, the specialty field leaders had higher mean scores for Social Awareness (11% higher), Self-Awareness (3% higher), and People-Oriented (398% higher). These findings indicate that specialty field

leaders are more likely to understand their emotions and those of others, to understand social situations, and to interact well with other people.

Specialty Field Leaders' Lower Mean HD Factor Scores

Specialty field leaders had lower mean scores in the Emotionality domain (10% lower), including in the subdomains of Fearfulness (12% lower), Dependence (24% lower), and Sentimentality (8% lower). These findings suggest that specialty field leaders are more likely to be brave, to be confident, and require little or no help when dealing with problems. These individuals are also less likely to be emotionally attached to others.

The lower mean score for Fearfulness suggests that specialty field leaders tend to be risk-takers. Therefore, if they become general contractor project managers, they may need to be more cautious in assessing risks and thereby preventing or mitigating them. The lower mean scores for Dependence and Sentimentality suggest that specialty field leaders are unlikely to pass on responsibilities to other team members. Because project management in mainstream construction involves interdependent processes that are more complex than those involved in specialty contracting, specialty field leaders who become general contractor project managers may need to learn more frequently to delegate tasks, leverage relationships, and collaborate with other team members and stakeholders.

CONCLUSION

As construction companies hire employees to fill positions that are new or that are available because of employee turnover or retirement, these companies need strategies to hire skilled labor. One consideration during the hiring process should be whether candidates have the skills needed to excel in construction jobs. Recognizing the people skills required for construction job roles is essential to determine if a candidate, new or old, is a good fit, especially when transitioning between job roles. This study contributed to the body of knowledge by identifying and comparing the human dimensions of skilled workers directly involved in field operations.

Results from the study showed that specialty field leaders had higher scores in Modesty, Diligence, Forgiveness, Patience, and Social Awareness. This indicates that specialty field leaders are more industrious, better at managing conflict, and more empathetic. Lower scores for Dependence and Sentimentality indicate that specialty field leaders may have shortfalls in some leadership competencies. From a management perspective, the specialty field leaders' lower scores in Dependence and Sentimentality can be complemented by their higher scores in Forgiveness, Patience, and Social Awareness when transitioning into the role of a project manager for a general contracting firm. They could exploit their strengths for better collaboration and alliances for the actualization of project objectives, as required by the position of a generator contractor project manager.

The differences between specialty field leaders and generator contractor project managers reveal that there are differences in personality traits of the job roles. The knowledge obtained from this study can be used by human resource professionals to have a better understanding of the potential strengths and weaknesses of potential hires. Furthermore, the findings of the study can help

construction practitioners transitioning between both job roles to be aware of the expectations of the new role. The shortfalls in their human factors should be addressed by well-tailored training and coaching to hone their people skills.

Furthermore, the curricula of colleges and universities can also be modified to accommodate activities and courses that would sharpen the people skills of construction students, in preparation for them to take on job roles in the industry.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

One limitation of this study is the relatively small number of participants who were specialty field leaders. Future research could be conducted to expand the data pool and include more specialty field leaders, particularly from specialty trades other than sheet metal and air conditioning.

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