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Identification of Safety Challenges Faced by Hispanic Construction Workers Using Photovoice

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Identification of Safety Challenges Faced by Hispanic Construction Workers Using Photovoice

by

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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Identification of Safety Challenges Faced by Hispanic Construction Workers Using Photovoice

Thesis directed by Prof. Matthew R. Hallowell

This research investigates the cultural and personal challenges faced by Hispanic construction workers in construction safety while it introduces photovoice as a research method in this field. As a direct implication of photovoice, the research framework deviates from past studies by eliciting information directly from the workers without using presupposed ideas such as surveys and questionnaires. Instead, it uses pictures captured by the participants to have vivid discussions of their everyday activities and their past experiences. The findings corroborate past research in that unfair work distribution, language barriers, and machismo are some of the principal challenges. However, the study further suggests that Hispanic workers feel a need to perform their work quickly. This need is based on their background and past experiences and leads to negligent and unsafe behaviors at the job site. In addition, the results also suggest that close friendships between Hispanic workers can negatively impact communication of safety related issues. This happens because workers fear damaging their relationships through their criticism. One final contribution deals with the racial differentiation that Hispanic workers notice at the jobsite. This according to them explains in part the unfair work distribution issues discussed in previous research.

Dedication

This thesis is dedicated in no particular order to:

My parents who taught me to never give up and pushed me through all my years of education; who supported me from the distance with all their love.

To my wife who listened to all my babbling and crazy ideas during the process and shared my frustration when things did not go as expected. Who supported me and gave me the last push through the finish line.

To my little brother for whom I wish this is a challenge to surpass.

To all Hispanic construction workers who come to this country leaving everything they know behind looking for better ways to feed their families.

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Chapter 1

1. Introduction

The construction industry is one of the largest manufacturing industries in the United States. According to the Center for Construction Research and Training (CPWR) (2013), construction contributed to 3.5% of the total gross domestic product in 2010. In the same year, 10.733 million workers were employed in the construction industry, representing 7% of the U.S. workforce (CPWR 2013).

According to the U.S. Bureau of Labor Statistics' (BLS) Current Population Survey (CPS), the construction industry accounted for 802 fatalities in 2010. This is the lowest annual count ever recorded (BLS 2012); however, construction still accounted for more fatalities than any other industry. In terms of non-fatal injuries resulting in days away from work, the construction industry ranked third among all major industries with a rate of 149.6 per every 10,000 full-time equivalent workers[1] (FTEe) (CPWR 2013). This rate is third only to the transportation and agriculture industries. Moreover, the Center for Construction Research and Training (2013) reported that construction workers generally take longer to recover from injuries than workers in other industries. Specifically, the 2010 rate of cases requiring a full month or more away from work was 50 per 10,000 FTEe whereas the rate was only 30 per 10,000 FTEs for all private industries combined.

Unlike other industries where processes are streamlined and outcomes are relatively stable, the construction industry has a project-based, dynamic, and transient nature. Work conditions are never the same between projects, the final product is always different, the type

[1] Full-time equivalent worker – Assumes that a full time worker works 2,000 hour per year (50 weeks of 40 hours).

of work required is varied, the labor force is very diverse, and there is a high degree of turn-over. Decentralization and mobility are also two defining characteristics of construction (Fang et al. 2006). Decentralization refers to the fact that construction workers are separated by sites and they have to make decisions by themselves when facing problems. Mobility, on the other hand, refers to the continuous movement of workers between companies, projects, and positions. This mixture of characteristics contributes to the disproportionate injury rate in construction.

Within the construction industry, data reported by the Center for Construction Research and Training (2013) shows that the fatality rate for Hispanic construction workers was, on average, 48% higher than for the white, non-Hispanic workers. This disproportionate injury rate is compounded by the fact that the proportion of Hispanic workers has been increasing in the last two decades in the construction industry, as a direct result of the increase of the overall Hispanic population in the United States. Recent census data show that the proportion of Hispanic construction workers has tripled between 1990 and 2010, rising from 705,000 to 2.2 million workers (US Census Bureau 2012). This increase has resulted in a situation where Hispanic workers are majorities in the construction industry in states such as New Mexico (representing 57% of the workforce), Texas (55%), and California (48%). In addition, the Hispanic population in the U.S. will more than double from 53.3 million in 2012 to 128.8 million in 2060 while the non-Hispanic white population will peak by 2024 at 199.6 million and fall to 179 million by 2060, and the African American population will only increase by 50% up to 61.8 million (U.S. Census Bureau 2012). The disproportionately high injury rate, compounded with the expected increases in the proportion of Hispanic workers, is a critical concern for construction safety management. Thus, we must better understand the wide array of factors that may contribute to disproportionate injury rates for this demographic.

1.1. Research Objectives

Given that a majority of Hispanic construction workers were born outside of the US and the evidence provided by previous research that language (Alsamadani et al. 2013) and personal values play a role in Hispanic worker safety (Menzel and Gutierrez 2010; Roelofs et al. 2011), the difference between the national cultures may be a potential explanation for the disproportionate injury rates. Hofstede (1980) defines national culture as the "collective mental programming of the mind acquired by growing up in a particular country". This investigation tries to specifically identify **the perceived cultural and personal challenges that impact the safety of Hispanic construction workers.**

Many researchers (Canales et al. 2009; Goodrum and Dai 2005b; Menzel and Gutierrez 2010; Roelofs et al. 2011) have studied the causes of the disproportionate injury rate for Hispanic construction workers. Goodrum and Dai (2005a) found that a probable cause for such disparity could be the fact that Hispanic workers tend to work in some of the most dangerous trades in the industry. Menzel (2010) and Roelofs (2011) found that some of the challenges faced by Hispanic construction workers are poor language and communication skills, health and worker rights illiteracy, and the role of some Latino Values such as machismo and respect for authority. This literature provides evidence that cultural aspects have a role in the disparity; however, **no previous study has focused solely on culture and no research systematically solicited experiential data directly from the workforce without presupposed factors.**

Chapter 2

2. Review of Relevant Literature

In order to develop an appropriate research framework, the research team reviewed existent literature in several related fields. Research on the effects of varied national cultures at multinational organizations helped identifying probable cultural differences between the Hispanic and the American cultures. Studies on the specific issue of Hispanic workers and safety in the construction industry provided an overview of the current body of knowledge. Information on organizational safety culture helped understanding what factors make up good safety programs and which of these factors may be related to national culture. Guidelines on research with Hispanic populations helped in the development of appropriate research questions and the identification of an appropriate research environment for the participants. Finally, a review of several Photovoice studies provided recommendations on the application of the research method including number of participants, research procedures, and probable issues when performing the investigation. The following sections describe our findings in each of these topics.

2.1. Cultural Differences – Hispanic vs. American

The concept of multi-national cultural differences has been widely studied and several theories and frameworks have been developed over time. Soares et al (2007), on a comprehensive review of these cross-cultural studies, summarized four types of theories: ethnological description, use of proxies, direct values inference, and indirect values inference. Ethnological description includes qualitative approaches generally sociological, psychological, and anthropological. Use of proxies refers to defining culture based on characteristics that reflect or resemble culture such as nationality or place of birth. The direct values inference approach measures the values of subjects in a sample, and infers cultural

characteristics on the aggregation of this values. Finally, the indirect values inference approach uses secondary data to assign cultural characteristics to groups without measuring members of the group. Researchers (Lenartowicz and Roth 1999; Soares et al. 2007) agree that all four approaches have weaknesses, so no single methodology can address all aspects relevant to a cross-cultural study like this one.

Hofstede (1980) developed a cross-cultural analysis framework that is theoretically based on the use of proxies but that also combines the direct values and indirect values approaches thus creating a robust model that reduces the weaknesses of each individual approach. As stated before, Hofstede (1980) defines national culture as the group programming of the mind that is acquired by growing up in a particular country. This reflects his belief that by analyzing countries separately one can identify country specific factors that define its culture. His study, conducted on The International Business Machines Corporation (IBM), involved employees in more than 70 countries. His findings suggest that culture is specific to national origin and that it can be broken down into five dimensions that are universal across cultures. Table 2.1 provides a definition and example for each dimension: Power Distance, Uncertainty Avoidance, Individualism vs. Collectivism, Masculinity vs. Femininity, Pragmatism vs. Normativity, and Indulgence Orientation.

Hofstede is not the only researcher that identified categories that are universal to all cultures. Soares et al (2007) identified other authors (Clark 1990; Inkeles and Levinson 1959; Steenkamp 2001; Triandis 1995) who also developed and used similar categories. However, Hofstede's theory (1980, 1991, 2001) is one of the most cited and used in management research because of its large data sample. He used 116,000 surveys from over 60,000 respondents in seventy countries and this rich data allowed him to develop country specific indexes for each dimension introducing the direct value approach to his framework. Table 2.2 shows the indexes and differences between Mexico and the United States. The comparison

shows deep cultural differences between both cultures in terms of power distance, individualism, and uncertainty avoidance. Such differences suggest that there is a mismatch between the Mexican workers' culture and the American workers and managers' culture that could translate into construction safety challenges.

Furthermore, Ibarra (1996) explains that cultural dimension rankings allow one to create charts that reveal clusters of countries that share cultural norms demonstrating the applicability of Hofstede's model under the indirect values approach. Using the different indexes, we mapped the location of all Latin American countries for which Hofstede has indexes available and the United States as shown in Figure 2.1 below. The figure shows that the cultural distance between these Latin American countries and the US is similar than that between Mexico and the US. The top left quadrant shows how Latin American countries have a much higher power distance index than the U.S., which in organizational settings reflects less willingness of workers to challenge authority. The figure also shows how Latin American countries are more collectivist than the U.S., a very individualistic country, which reflects the importance of the direct family and the extended family. The top right quadrant shows how Latin American countries are less accepting of uncertainties than the U.S. and, as result, Hispanic workers are more likely to have trouble accepting new ideas. Finally, the bottom two quadrants show how some Latin American countries share the same masculinity, pragmatism, and indulgence index as workers in the U.S.

The data provide some initial evidence of the cultural difference between Hispanic cultures and the American culture based on prevailing theory (Hofstede 1980). It should be noted here that there has been some criticism to the use of Hofstede's cultural dimensions indexes for numerical and statistical comparisons between countries (Canales et al. 2009). Critics argue that culture cannot be summarized into these five categories because culture is such a broad concept that has multiple definitions, some of which go beyond what these five

represent. However, Hofstede's theory still represents a well-cited framework that can be used as a starting point to develop research questions and prompts during a photovoice study.

Table 2.1: Hofstede's Cultural Dimensions[2]

Dimension	Definition	Cases
Power Distance	The extent to which a national culture accepts and reinforces that power in institutions and organizations is distributed unequally	In cultures with high power distance, status differences are viewed as legitimate and intrinsic. In an organizational setting this results in that the bosses are viewed as authoritarian while subordinates are more willing to accept decisions from superiors and less willing to question authority. Conversely, in cultures with low power distance status difference are viewed as if they were established for convenience in a particular context.
Uncertainty Avoidance	The degree to which a national culture values the reduction of uncertainty and ambiguity	In cultures with high uncertainty avoidance people want to reduce the effects of uncertainty by establishing formal rules or believing in absolute truths. In organizations this means that formal laws and informal rules establish employees' rights and duties. In cultures with low uncertainty avoidance there is more acceptance for new ideas and willingness to try new or different things. This results in fewer rules.
Individualism – Collectivism	The degree of interdependence a society maintains among its members	Individualist societies value a loose social framework where people is only expected to take care of themselves and their immediate family. Conversely, in collectivist societies people tend to belong to in-groups that take care of them in exchange for loyalty.
Masculinity – Femininity	Measures what motivates people. In this case masculinity refers to a desire to be the best while femininity points to liking what you do	In cultures with high masculinity, the society is driven by competition, achievement and success (defined by the winner/best in field). This behavior starts from school and expands to organizational behavior. In cultures with feminist societies dominant values are caring for others and quality of life. Success is measured through quality of life while standing out from the crowd is not admirable

[2] Data from (Hofstede 1980, 1991, 2001) available at www.geert-hofstede.com/

Table 2.1: Hofstede's Cultural Dimensions (Continued)

Pragmatic – Normative	Describes how people in the past, as well as today, relate to the fact that so much of what happens around us cannot be explained	In cultures with a normative orientation people have a strong desire to explain as much as possible. People exhibit a great respect for traditions, small propensity to save for the future and a focus on achieving quick results. In cultures with a pragmatic orientation people do not feel the need to explain everything, as they believe it is impossible to understand fully the complexity of life. People show an ability to adapt traditions easily to changed conditions, a strong propensity to save and invest, thriftiness and perseverance in achieving results
Indulgence – Restraint	Refers to the extent to which people try to control their desires and impulses based on the way they were raised.	People in cultures with high indulgence show a willingness to realize their impulses and desires with regard to enjoying life and having fun. They place a great degree of important on leisure time, act as they please and spend money as they wish. In comparison, people in cultures with a high restraint have a tendency for cynicism and pessimism. They have the perception that their social actions are restrained by social norms and feel indulging themselves is somewhat wrong.

Table 2.2: Cultural Dimensions Index Comparison Mexico vs. United States

Dimension	Mexico		United States	
Dimension	**Index**	**Description**	**Index**	**Description**
Power Distance	81	Hierarchical society. People accept a hierarchical order in which everybody has a place. Hierarchy in an organization is seen as reflecting inherent inequalities, centralization is popular, subordinates expect to be told what to do and the ideal boss is a benevolent autocrat.	40	Within American organizations, hierarchy is established for convenience, superiors are always accessible and managers rely on individual employees and teams for their expertise. Both managers and employees expect to be consulted and information is shared frequently. Communication is informal, direct, and participative
Uncertainty Avoidance	82	High preference for avoiding uncertainty. This type of culture has rigid codes of belief and behavior, and people are intolerant of unorthodox behavior and ideas. Here, there is an emotional need for rules and people have an internal need to be busy and work hard	46	American society could be described as uncertainty accepting. There is acceptance of innovative ideas, and willingness to try something new or different
Individualism – Collectivism	30	Mexico can be considered a collectivist society, this results in long-term commitment and greater importance of the group which can be family, extended family, or extended relationships. The society fosters strong relationships where everyone takes responsibility for fellow members of their group	91	American society is highly individualistic. There is a loosely-knit society where the expectation is that people look after themselves and their immediate family. In organizational terms, employees are expected to be self-reliant and display initiative

Table 2.2: Cultural Dimensions Index Comparison Mexico vs. United States (Continued)

Masculinity – Femininity	69	Mexico is a masculine society where people "live in order to work". Here, managers are expected to be decisive and assertive	62	American society is a masculine society. Similarly, to Mexico, Americans live to work as the society recognizes that people should strive to be the best they can be and that the goal is to win
Pragmatism Index	24	The Mexican society can be characterized as normative. This means that people have a strong concern with establishing the absolute truth, and show a great respect for traditions, and focus on achieving quick results.	97	Similar to the Mexican society, the American culture is also normative. This can found is several examples: • Americans are prone to analyze new information to check whether is truth • Americans have strong ideas about what is "good" and "evil" • American businesses measure their performance on a short-term basis, with profit and loss statements issued on a quarterly basis.
Indulgence Index	97	Mexico is a very indulgent country. People look to realize their impulses and desires with regard to enjoying life and having fun. There is a high degree of importance on leisure time.	68	Although the U.S. ranks lower than Mexico on this Dimension, the American culture can be characterized as indulgent. Some examples of this attitude are: • The work hard play hard idea • Although there is a strong war against drugs, drug addiction in the U.S. is higher than in many other wealthy countries

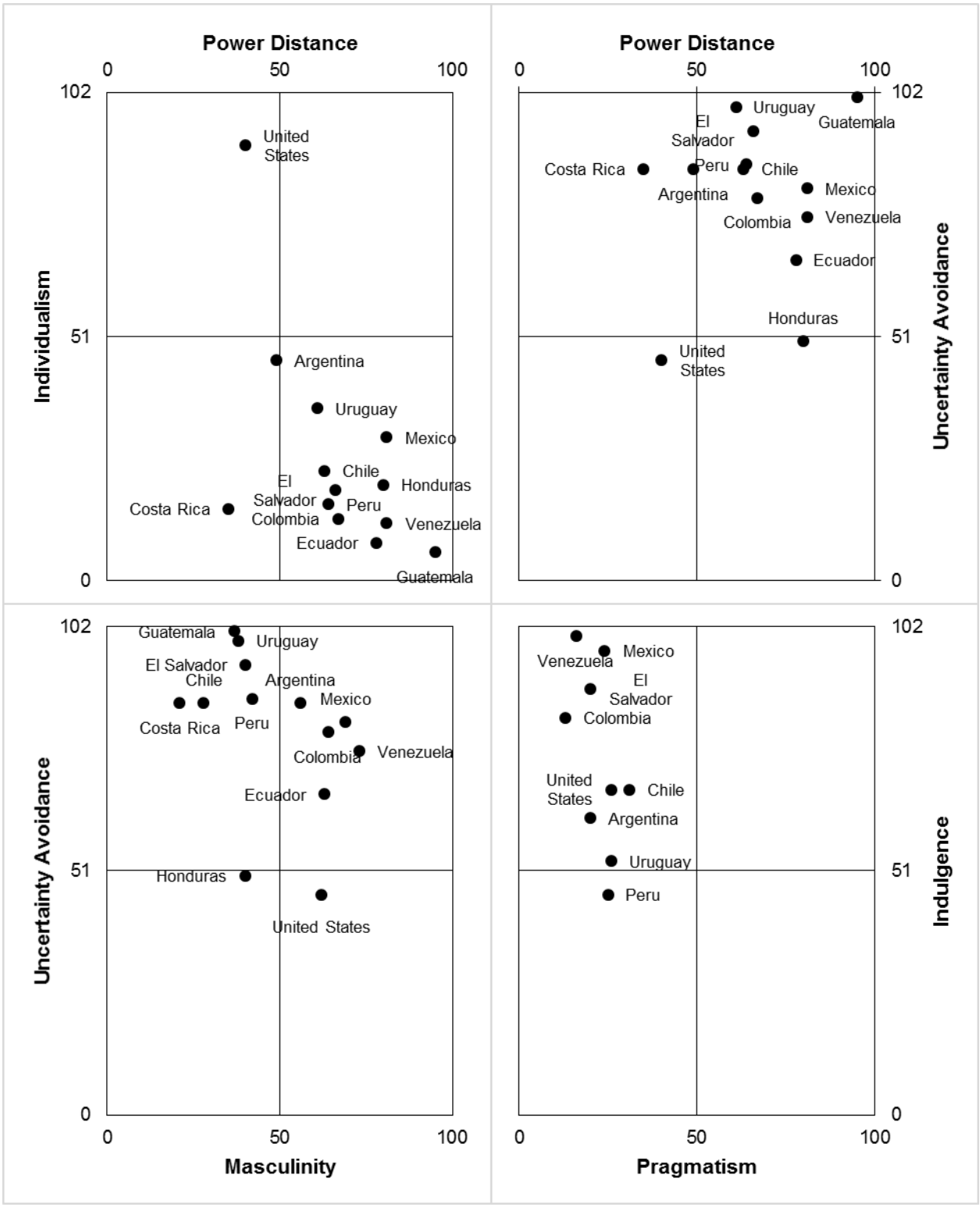


Figure 2.1: Position of Latin American Countries vs the US using Hofstede's Ratings

2.2. Hispanic Construction Worker Safety

As discussed, Hispanic construction workers in the US have consistently suffered more work related fatalities than any other non-Hispanic group. Several research efforts have been conducted to analyze the probable causes behind the disproportionate rate and to develop methods to effectively address the issue in construction institutions. Specifically, literature that discusses the type of work, cultural challenges, and communication barriers are discussed.

2.2.1. Type of Work Performed

Goodrum and Dai (2005a) and Menzel and Gutierrez (2010) suggest that there is a correlation between the type of work performed by Hispanic workers and their high injury and fatality rates. Using Bureau of Labor Statistics data the Center for Construction Research and Training (2013) found that, between 2008 and 2010, the *Laborer* and *Carpenter* trades were the two most common for Hispanic construction workers. The same study revealed that *Laborer*, *Foreman*, and *Carpenter* were the top three trades with most fatalities and *Laborer* and *Carpenter* had the largest number of non-fatal injuries resulting in days away from work. Additionally, based on the risk perceptions of Hispanic workers in Southern Nevada, Menzel and Guttierrez (2010) revealed that those workers with low skill level positions (e.g., painters and laborers) perceived more risk than those performing higher skill work (sheet metal workers). Laborers and painters noted that they are more willing to take higher risks because they are afraid of being fired if they complained in part due to their immigration status. Further, they believed that their employers gave more dangerous jobs to Hispanic workers compared to other workers of different ethnicities. Another difference was that laborers/painters assigned the responsibility for safety to their employer while metal

sheet workers identified themselves as responsible for safety and not their employees. Finally, and perhaps the most relevant, was that employer size was related to the skill level of the work. Large construction companies that had strong health and safety training programs employed sheet metal workers while, in contrast, small subcontractors with weak safety programs employed laborers and painters.

2.2.2. Cultural Differences

Many authors (Brunette 2004; Farooqui et al. 2007; Lavy et al. 2010; Menzel and Gutierrez 2010) suggest that the high fatality and injury rates among Hispanic construction workers are influenced by cultural differences between Hispanic workers and their White counterparts. Farooqui et al. (2007) for instance, conducted root cause analyses of workplace injuries among Hispanic construction workers and found that many Hispanic construction workers are reluctant to challenge authority in construction jobsites. This leads to workers not requesting adequate personal protection equipment (PPE) when needed for fear of retaliation from their employers. Menzel et al. (2010) surveyed 30 union and non-union Hispanic workers and found corroborating evidence. Furthermore, their finding also suggests that other Latino Values such as machismo and respect for the elder also have a role in construction safety. Machismo, for instance, often results in workers not reporting injuries or risks and the lack of use of PPE, even when it is available and encouraged. Finally, one last cultural attribute discussed in the literature is *familismo*, which is related to the strong family ties displayed by many Latin American cultures. An example of the effect of *familismo* can be found when Hispanic workers consider their closest peers a part of their extended family which can result in workers communicating injuries and safety risks to their peers and not to upper management or supervisors (Smith et al. 2006).

2.2.3. Language and Communication

A component of culture, language has proven to be a significant barrier for Hispanic workers. According to the Center for Construction Research and Training (2013) about 45% of Hispanic immigrant workers cannot speak English very well and over 25% cannot speak English at all. This issue affects understanding of training materials and safety signals provided by the employer. More importantly, however, the lack of English proficiency directly affects safety communication among workers and between workers and management on a construction site. Alsamadani et al. (2013) used social network analysis to study this issue with small construction work crews. They found that, in the case where the members of a crew speak only one language, the crews have an average injury rate that is 51% lower than crews whose members prefer to speak more than one language. Jaselskis et al. (2008) conducted a needs assessment among construction companies and found that 75% of American construction supervisors have a translator who helps them communicate with Spanish-speaking workers. The need for translators illustrates the inability of American supervisors to directly communicate with all crew members, which ultimately reduces the effectiveness of their communication. Alsamadani et al. (2013) illustrated the importance of bilingual workers and managers who often serve as the only conduit of communication in multi-lingual crews.

2.2.4. Other Contributors

In addition to culture and communication issues, literature shows that there are other factors that can play a role on the higher injury and fatality rates for Hispanic workers. Roelofs et al. (2011) surveyed two groups of Hispanic construction workers and found that Hispanic workers feel more pressure to work faster than their non-Hispanic counterparts. In

addition, non-Hispanic workers have more knowledge of their rights as employees and therefore know when to report injuries or raise concern when treated unfairly. Finally, most Hispanic workers have a fear of losing their job if they raise safety concerns, which translates to a higher risk tolerance than White workers.

The relevance of this study in comparison to these past investigations is due to the nature of the data collection process. In past research, investigators have used presupposed ideas to develop research frameworks and tools to gather data from workers and managers. Conversely, this research gathers information is a systematic way that makes each participant worker the generator of his own data. Using this data collection method reduces the possibility of overlooking information as a result of these presupposed ideas.

2.3. Safety Culture

After discussing the concept of national culture and its connection to the Hispanic worker population, the subject of safety culture at organizations helps describe the relationship between culture and construction safety. Cooper (2000) defines corporate culture as, “the shared behaviors, beliefs, attitudes and values regarding organizational goals functions and procedures.” Furthermore, he identifies safety culture as a subcomponent of corporate culture. In 1993, the Advisory Committee on the Safety of Nuclear Installation (ACSNI) gave one of the first definitions of Safety Culture which states that: "the safety culture of an organization is the product of individual and group values, attitudes perceptions, competencies, and patterns of behavior that determine the commitment to and the style and proficiency of an organization's health and safety management" (Choudhry et al. 2007). According to this definition, the strength of a company's safety culture determines safety performance.

Literature in the area of safety culture abounds. Researchers have tried to identify the components that make a up a strong safety culture (Choudhry et al. 2007; Cooper 2000; Fernández-Muñiz et al. 2007). Specifically, McAfee (2012) identified nine dimensions in literature that contribute to safety culture and safety performance:

- *Patterns of behavior and norms* – The degree to which there is consensus among individuals, groups, and organizations in the relationships between psychological and behavioral factors (Cooper 2000). Behavioral norms are an internal personal factor and are usually more important at the crew level than the individual or organizational levels.
- *Shared Values and Beliefs* – Values and beliefs are a core dimension as they define why a specific behavior is desired. Once again this is the degree to which there is consensus among employees of different groups and levels. This dimension is an internal personal factor.
- *Attitudes and Risk Tolerances* – Attitudes can be described as having a direction at a specific object or entity such as policies and safety equipment, but also can directed at behaviors such as risk taking or violating rules. This dimension is an internal personal factor and can be summarized as the "personal appreciation of risk."
- *Management commitment* - The extent to which the firm's managers are committed to workers' safety (Fernández-Muñiz et al. 2007). This includes allocation of time and resources towards safety and participation in risk assessments and committee meetings. It also includes managers' knowledge of safety issues, stated convictions towards high safety standards, and the actions towards this goals. One important aspect to consider on this dimension is that it is not only reflected on the managers' behavior but also in the employees' perceptions of such commitment.

- *Technical Practices and Risk Assessment* – This dimension refers to the way that a company deals with safety risks and minimizes employee exposure to danger. What is most important here is the physical implementation of the policies and procedures put in place related to safety.
- *Organizational Structure* – Organizational structure affects safety performance as a result of the specific work relations between management and employees. It can be viewed in the roles, responsibilities, and the flow of communication within the organization.
- *Social Practices and Worker involvement* – The degree of worker's compliance with the safety procedures and the extent to which they participate in improving working conditions (Fernández-Muñiz et al. 2007). This includes how much employees support and influence the safety procedures and how willing they are to confront other employees about safety issues.
- *Competencies* – It refers to the general knowledge and ability of employees to implement safety measures.
- *Assumptions* – This dimension is described by how members of an organization perceive and react to their environment. An example of this can be the extent to which individuals wait for instruction or act independent and how competitive they are.

From these characteristics and definitions one can see that a positive safety culture is directly related to an individual's values, beliefs, norms and patterns of behavior all of which constitute the definition of culture. The complex whole that includes knowledge, belief, art, morals, custom, and other capabilities and habit acquired by man as a member of society (Soares et al. 2007).

2.4. Characteristics of Research on Hispanic Populations

Studying Hispanic populations requires that investigators design their research with an understanding of Hispanic culture. Brunette (2004) establishes four main characteristics that should be addressed.

- **Understanding the Background of the Hispanic Workforce** - The construction industry's Hispanic workforce has a strong and diverse background that affects their work attitudes and expectations. It is crucial to understand that most Hispanic construction workers are foreign-born and, therefore, are subject to their past experiences and background that is typically very different from experiences of U.S.-born workers. Such experiences impact a worker's level of safety awareness.
- **Participatory Approach** - Brunette (2004) suggests the use of participatory research methods. Involvement of the workers in the design, development, and evaluation stages is important as this permits for creative input from the workers themselves and helps to broaden the perspectives of the researchers.
- **Translation Methods** - This is a critical aspect in all research with non-English speaking populations. The materials provided should be linguistically and culturally appropriate and easily understood by the target audience.
- **Need for Collaborative Research** - Research on Hispanic worker construction safety should be cross-disciplinary. This includes participation from different academic backgrounds including engineering, safety, occupational health, social sciences, and others. Research in this area requires a Holistic approach that takes into consideration not only work-related factors but also socioeconomic and cultural factors.

Given these research design suggestions, we elected to conduct a Photovoice study to achieve our research objectives. Photovoice is a participatory approach that allows the creative input of the participants and is collaborative in nature. The method has roots in research of women rights, photography, and psychology. Additionally, Photovoice was selected because it has been a powerful agent for policy change with vulnerable populations.

2.5. Photovoice

Photovoice is a subset of a larger group of study designs known as photo-elicitation. Photo-elicitation is a qualitative research technique that introduces the use of photographs in an interview. The term photo-elicitation was introduced by Collier (1957) who used photographs on an investigation of mental health in changing communities in the maritime provinces of Canada. Collier (1957) expressed that the pictures elicited longer and more comprehensive interviews while at the same time "helped subjects overcome the fatigue and repetition of conventional interviews" (Collier 1957 p. 857). This effect can be explained by the fact that the parts of the human brain that processes visual information is evolutionarily older than the parts that process verbal information; thus, images evoke to deeper elements of human consciousness than do words (Harper 2002). Other advantages of using pictures in interviews are that photographs can promote rapport between the researchers and the participants and reduce awkwardness between the researchers and the participants (Samuels 2004).

There are various methods of performing a photo-elicited interview, with varying degrees of formality. The major differences lies in who takes the photographs that are used as subjects in subsequent interviews. First, in auto-driven photo-elicitation participants take photographs that represent experienced related to topics specified by the investigator.

Samuels (2004) on a study on the understanding of the Sri Lankan monastic culture found that using auto-driven photographs instead of interviews alone helped participants to focus responses on specific ideas, leading to more concrete and emotionally grounded descriptions. Additionally, providing cameras to the participants resulted in a greater interest in participation.

Photovoice is a specific form of auto-driven photo-elicitation. It is specific because it was developed by Caroline Wang (1997) to be used as a community-based participatory research method (CBPR). In CBPR research the investigators attempt to equitably involve community partner in research, draw on their knowledge and experience, share decision-making responsibility, and build community capacity (Castleden et al. 2008). To promote characteristics of CBPR, Photovoice is based on two main theories:

1. Theory of critical consciousness (Freire 1970) which seeks the engagement of individuals in the questioning of their historical and social situation. The visual image enables people to think critically about their community, and to begin discussing the everyday social and political forces that influence their lives (Wang and Burris 1997).
2. Documentary photography which suggests that providing a camera to people who might not normally have access to one will empower them to record and instigate change in their communities (Castleden et al. 2008).

Photovoice can be viewed as a method to empower vulnerable populations through the use of photographs, acknowledging that the participants have the best knowledge about their own situation. One main advantage of the method is that it is flexible and can be adapted to various participatory research goals and any group or community. It does not require participants to be able to read or write, speak the research's dominant language, or be fully literate. Examples of Photovoice application are the research on social health issues of women in rural communities of China (Wang 1996), research on indigenous populations in Canada

(Castleden et al. 2008), effects of immigration in the lives of Latino adolescents (Streng et al. 2004), or investigation on improving family planning services for immigrant Hispanics (Schwartz et al. 2007). The previous literature review provides strong background information and guidelines to perform a rigorous Photovoice investigation.

2.6. Point of Departure

Up to this point we have reviewed past investigations that try to explain the causes behind the disproportionate injury rates between Hispanic and non-Hispanic construction workers. We have discussed the issues of communication (Alsamadani et al. 2013), type of work performed (Goodrum and Dai 2005a; Menzel and Gutierrez 2010), reluctance to challenge authority (Farooqui et al. 2007; Menzel and Gutierrez 2010), machismo (Menzel and Gutierrez 2010), familismo (Smith et al. 2006), and pressure to work faster (Roelofs et al. 2011) as the already identified causes. We have also introduced the concept of national culture as an explanation of the cultural differences between the Hispanic and the American cultures. We have mapped the location of Hispanic countries and the US according to Hofstede's (1980) theory and indexes showing that Latin American countries share similar cultural values and that they share radical cultural differences in power distance, individualism, and uncertainty avoidance. Finally, we have reviewed the concept of safety culture discussing the elements that make up a good safety culture and their relationship to personal and national culture.

From this point forward the study deviates from past research through the use of photovoice. Rather than using preconceived ideas to develop the research materials, our data is systematically generated directly by the participants using their opinions, experiences, and day to day activities. Studying culture as differentiator between Hispanic and non-Hispanic workers is warranted by the national cultures theory while the relationship between

construction safety and culture is supported by the characteristics that make up a good safety culture at an organizational level.

Chapter 3

3. Methods

This study focuses on identifying such aspects of culture that play the most significant role in construction safety. In comparison to other studies which made use of data surveys (Farooqui et al. 2007; Goodrum and Dai 2005), needs analysis of construction companies and construction leaders (Jaselskis et al. 2008; Lavy et al. 2010), and focus group interviews with construction workers (Canales et al. 2009; Menzel and Gutierrez 2010; Roelofs et al. 2011), this project introduces Photovoice, otherwise known as Photo-elicitation, to construction safety research for the first time. Photovoice is a participatory research tool originally developed for medical research with vulnerable populations. The technique provides rich experiential data generated from the subject's ideas and perceptions through the use of self-captured photographs.

3.1. Application of Photovoice

Palibroda et al (2009) describe nine steps required to conduct a Photovoice study (Table 3.1). Although these steps were designed for research on the field of women's health, other researchers on the fields of community improvement, quality of life improvement, and living with disabilities also followed a similar procedures (Hergenrather et al. 2009). The protocol used for this research applies steps one through seven as described in Table 3.1 but excludes the Photovoice exhibition and the social action steps. The reason is that the situation of the Hispanic construction workers in the United States is somewhat different to that of other subject populations in which Photovoice was previously used such as Chinese village women (Wang 1996) or Latino school children (Streng et al. 2004). In the case of construction workers, social change cannot be easily promoted, as the number of workers and geographic

dispersion is very large. However, the author expects that this study will shed some light on critical issues, which can spur additional research and action.

Table 3.1: Photovoice Steps

No	Step (Palibroda et al. 2009)	Description (Palibroda et al. 2009)	In this Research
1	Connecting and Consulting with the Community	Identify, connect and build trust with a target community in order to identify a challenge or issue.	Previous researchers have approached the communities of construction workers in general and Hispanic construction workers in specific in the past. These previous studies in combination with industry statistics revealed that Hispanic workers suffer more accidents than non-Hispanics
2	Planning a Photovice Project	Develop the research procedure including funding, meeting locations, equipment, and IRB approval,	Planning procedures included developing this research procedure, obtaining IRB approval, obtaining permission from different construction organizations to contact their workers and use their construction sites, and procuring all research related materials.
3	Recruiting Photovoice Participants and Target Audience Members	Recruit and bring together participants who will carry out the Photovoice process taking pictures and target audience members who can influence policy change.	Workers were recruited through their employers or with announcements at the construction site.
4	Beginning the Photovoice Project	Have a project timeline well defined including the number of meetings required, dates and times. Have a chosen Photovoice group.	The project timeline was depending upon the construction site schedule and the availability of the workers. The initial plan included three meetings within a three-week period. A single Photovoice group could not be identified due to geographical dispersion of the participants.
5	Photovoice Group Meetings	Conduct the Photovoice meeting, identify the group goals, and obtain informed consent. Teach how to use the cameras, develop photography themes, and	A first exploratory meeting served to obtain informed consent and to identify the group goals and Photovoice themes. A second, pre-Photovoice, meeting served to give photography advice, assign

		provide recommendation for pictures including human subjects.	Photovoice themes, and give general recommendation.
6	Data Collection	Participants capture the pictures according to the themes.	Workers captured pictures using the themes as a guideline.
7	Data Analysis	Group selection of the photographs and telling of the stories. Use of the SHOWeD (Table 3.4) protocol to facilitate discussion.	The workers chose their best pictures and discussed their stories individually. The SHOWeD (Table 3.4) protocol was used to facilitate discussion. Content analysis was used to analyze all data collected.
8	Preparing and Sharing the Photovoice Exhibit	Prepare and share the Photovoice findings to the people who can promote policy change.	Not performed
9	Social Action and Policy Change	Photovoice findings influence policy change to improve the identified issue.	Not performed

The research protocol of this investigation was divided into two parts: the exploratory phase and the Photovoice phase. The Photovoice research steps described above were included within these two stages as shown in the figure below and are discussed in the following sections. The primary purpose of the first phase was to gather preliminary data from the participants through focus groups in an informal setting. The data generated was used to develop the Photovoice themes used in the second stage. A secondary objective during this stage was to build rapport with the participants and to introduce the Photovoice process. The objective of second phase was to conduct the Photovoice investigation gathering the core data of the research using the prompts generated before. Here, the workers contributed individually in a more formal setting.

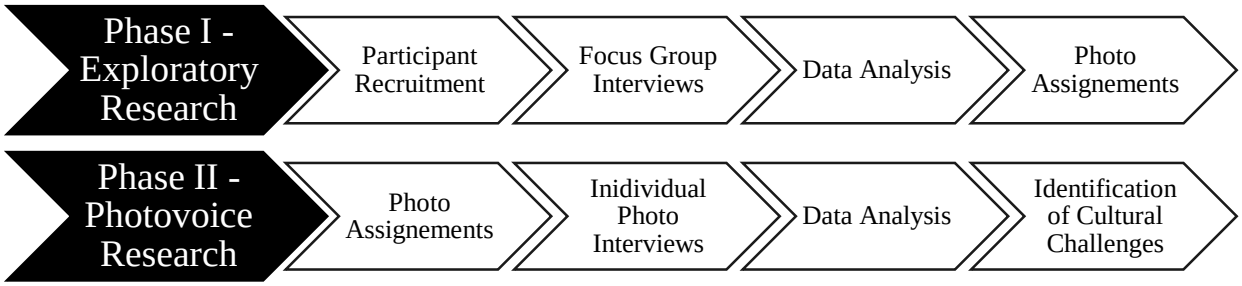


Figure 3.1: Research Steps Summary

3.2.1. Participant recruitment, sample size, and number of interviews

Our objective was to include the same subjects in the exploratory interviews and the Photovoice portions of the study to ensure that the experience of the subject group were integral to the entire process. Past Photovoice studies have a broad range in the number of participants chosen. Hergerather et al (2009), in a review on 31 Photovoice studies, found that the number of participants ranged from 4 to 122, and that the average participant number was 20.9. In these studies authors noted that saturation and replication were observed most commonly after the 14th Photovoice interview. Thus, our team decided to recruit between 15 and 20 participants. In order to recruit participants for this study, several team leaders at different construction sites in Colorado were contacted. Five contractors agreed to participate in the study and the research team approached the workforce soliciting voluntary participation. Workers in the laborer and carpenter trades were the initial focus of the recruitment because, as stated before, these are some of the most dangerous trades in the industry. However, other workers from other trades (iron workers and pipefitters) were included. In total, 17 workers completed the entire Photovoice study. From the workers who completed the study 16 were Hispanic Spanish speaking and one was non-Hispanic English speaking. This non-Hispanic was allowed to participate because he was in every day interaction with Hispanic workers as he was part of a multicultural crew.

For the focus group interviews the participants were interviewed in four groups, one for each construction site. The group division and interview order are shown below in Table 3.2. Bernard (2000) establishes that groups that are too large (n > 12 participants) can become difficult to manage and groups that are too small (n < 6 participants) may be susceptible to dominance bias. Only two of the groups meet these guidelines; however, the first group was used as the primary data for the Photovoice prompts and the subsequent groups were used for intermediate validation.

Table 3.2: Exploratory Interview Group Size and Order

Site	Participants	Date
1	7	3/10/2014
2	4	3/17/2014
3	10	4/14/2014
4	5	5/21/2014
5	4	8/15/2014

3.2.2. Focus group protocol

Focus groups were chosen to collect initial exploratory data because the method allows the research team to gather large amounts of information in relatively short periods of time, permits the generation of insights into topics that were not previously well understood, and allows the investigator to explore related but unanticipated topics without the need of complex sampling techniques (Berg 2009). Focus groups have been widely used in studies with similar objectives such as obtaining general background information about a topic of interest, gathering research hypothesis that can be used for further research and testing

using more qualitative approaches, and learning how respondents talk about a phenomenon of interest which may assist to other qualitative research tools (Berg 2009).

Open-ended questions were preferred over close-ended questions as these allow participants to answer the questions in their own words rather than obligating them to select their answers from a predetermined set of responses (Foddy 1993). The questions used on this phase, shown in Table 3.3, were ordered in a funnel like manner as suggested on different focus group studies (Halcomb et al. 2007; Umaña-Taylor and Bámaca 2004). The first is an introductory question that allows participants to get familiar with the research objective. The following are two transition questions that try to stimulate and bring participants into discussion. The next three are the key research questions, which are designed to generate discussion about the safety challenges faced by Hispanic workers. The final question aims to codify the results and solicit final comment.

The focus group interviews were conducted in English and Spanish, depending on the preferences of the workers. Umaña-Taylor and Bámaca (2004) suggest from their experience on focus group research in Latino populations the use of a facilitator that is from the same origin than the participants, as this disinhibits the participants and enriches discussion. Therefore, the principal investigator conducted the interviews as he comes from a Latin American country and is a native Spanish speaker.

Table 3.3: Phase I Questions

Introductory Question	Please tell us your first name and the first thing that comes to your mind when talk about safety and Hispanic workers.
Transition Question	What challenges do you face as a construction worker that you think negatively impact your safety?
Transition Question	Do you think there are any safety differences between Hispanic and non-Hispanic workers at construction jobsites?

Key Question	Recent statistics show that Hispanic workers suffer more deadly accidents than non-Hispanic workers in the construction industry. What do you think can explain such issue?
Key Question	People that were raised entirely or in part with some influence from a foreign country usually have their own ways doing things that are very specific to the country of influence. If we call this way of behaving "culture", do you think that culture plays a role in construction safety? If so what things can you identify about your own culture that affect you safety?
Key Question	Culture defines everything we do. It includes how we see authority, how we perceive our family and friends, how we define what is right and what is wrong, how we understand the things that we learn, and even how willing we are to accept new ideas. Do any of this factors negatively affect the safety of Hispanic construction workers? Can you identify any other factors?
Ending question	As you know the purpose of this interview is to identify the themes that we will use on the next phase to capture pictures at the site. What topics do you think are appropriate that will help us understand how culture affects safety?

3.2.3. Data Collection

Before conducting the focus group meetings, the research protocol and the benefits were discussed with the participants. Additionally, informed consent was obtained in accordance with the Internal Review Board (IRB) protocol. During the interviews the workers were told that there were no right or wrong answers. Given that this stage was only exploratory and one of its objectives was to build rapport with participants, interviews were conducted in an informal setting. Refreshments were provided as some researchers have found that eating promotes conversation (Krueger and Casey 2000). On this stage, the interviews were not audio taped in order to the make the participants feel more comfortable with the investigation.

3.2.4. Data Analysis

The majority of the data was collected through field notes taken during and after the meetings. The research team evaluated the notes to establish patterns that could be used, along with findings from literature, as prompts for the second phase where rich experiential data would be obtained.

3.3. Phase II – Photovoice Study

The objective of the Photovoice phase was to specifically identify the aspects of Hispanic workers' culture that affect their safety as perceived by the workers. The unique contribution made by this study was that the data collected were based on worker's experience and the methods used promoted the collection of factors that have not yet been identified. The method also allows researchers to gain a better understanding of the personal experiences of the workers, rather than obtaining responses to predefined questions. Although Photovoice has never been applied to construction safety research, its high adaptability allowed for easy application on this study.

3.3.1. Step 2 - Photovoice Introductory Meeting

The participants were recalled to an introductory meeting a week after completion of their focus group. This meeting had two main purposes. First, the participants were instructed on the use of the disposable cameras. Here, the workers not only received instruction on the mechanical aspects of the camera, but they were also given some basic photography tips such as keeping their fingers out of the camera lenses, placing the sun at their back as often as possible, and trying to show not only the object of interest but also some background. The author tried to keep the technical advice to a minimum in order to minimize the effects on their creativity as suggested by Wang (1996). Second, the participants received

their Photovoice assignment that was drawn from the results obtained from the focus group discussions, and which is discussed in the results section of this paper. The participants were asked to capture any object, individual, condition, object, etc. that related to the prompts. They were asked to capture things that they felt were different for them as Hispanic workers than for their non-Hispanics colleagues, as well as things that they felt were exclusive to them as Hispanic workers. The participants were given one week to complete the assignment, which was usually extended for a couple more weeks as requested by the participants.

3.3.2. Step 3 – Data Collection

Upon completion of the Photovoice assignment the cameras were collected and the photographs processed. All the cameras were marked with identifiers related to each participant. One week after completion of the photo assignments the author proceeded to interview the participants to discuss their photographs. Wang and Burris (1997) and Palibroda et al (2009) suggest the use of group discussions to collect the reflections of the participants on their photographs. However, Hallowell and Gambatese (2010) on a discussion on the Delphi technique enumerate a variety of issues that can cause biases in the collection of data in group settings not considered by Wang and Burris (1997) and Palibroda et al (2009). One of these biases is the issue of dominance, which happens when one group member, usually very vocal and intimidating, dominates the discussion and opinions of others (Hallowell and Gambatese 2010), especially those with a quiet personality who prefer to remain silent even though they have their own opinions. Furthermore, another issue that can come from a group setting is the "bandwagon effect" which describes how individuals unconsciously feel pressure to conform to the common or standard beliefs within a group (Hallowell and Gambatese 2010). Since the first phase involved focus groups and in order to avoid these cognitive biases, the team chose to conduct individual interviews with the

participants. This method also promoted a larger database and more individual participation as each worker was requested to discuss four or five pictures.

The interview procedure was guided by the SHOWeD procedure developed by Wang and Burris (1997) and applied in many Photovoice studies. SHOWeD is a mnemonic for a set of questions that allow the collection of the participant's reflections on their photographs. The questions used here were adapted to fit the characteristics of the industry and the participants, and are shown in Table 3.4.

Table 3.4: SHOWeD Protocol

S	What do you **S**ee here?
H	What is actually **H**appening here?
O	What does this picture tell us about your **O**rganization?
W	**W**hy does this issues or challenges exist?
e	How could this picture **E**ducate other people of your situation?
D	What changes can we **D**o about it?

3.3.3. Step 4 – Data Analysis

The author first transcribed the interviews verbatim in Spanish. Then, in order to reduce bias in the interpretation of the information, the author and an undergraduate research assistant analyzed each transcription separately. To safeguard the privacy of the participants and their employers the principal investigator replaced all personal identifiers and company names in the transcriptions. The materials were analyzed using QSR NVIVO, a code and retrieval software for content analysis of non-quantitative data.

Content analysis is a research method that detects, records, and analyses the presence of words and content in any form of communication (Walter 2010). This method is similar to

the tagging system commonly used in websites to identify, group, and organize similar pieces information. In this case, the text within a piece or multiple pieces is broken down and organized into categories that represent a recurrent meaning within the transcript. Walter (2010) and Harding (2013) provide several guidelines to conduct content analysis. These guidelines helped developing the analysis process shown in Figure 3.2 used on this investigation.

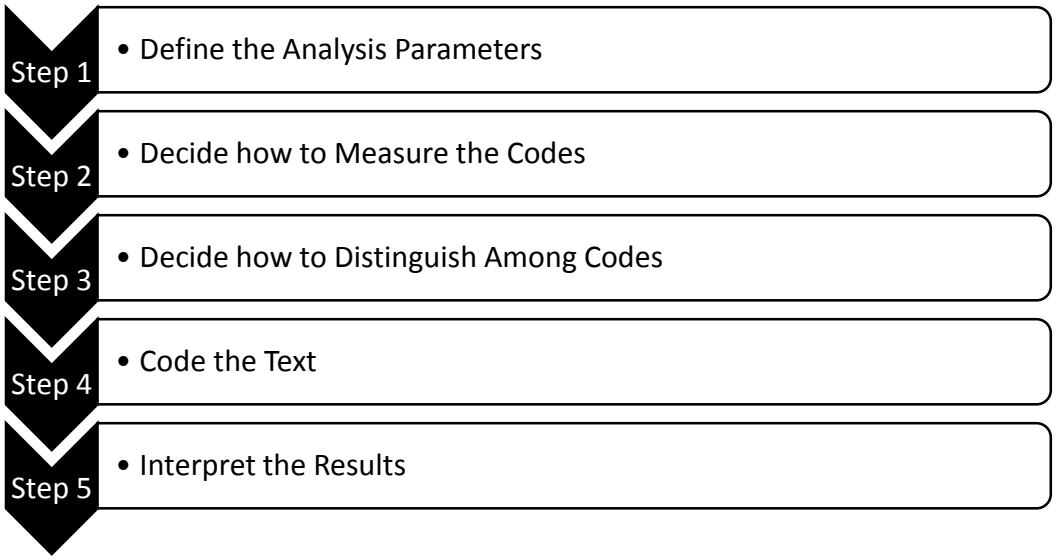


Figure 3.2: Content Analysis Process

The first step involved the selection of analysis parameters. In this case, the parameter included the number of categories to be included, how the categories would be developed, and how the text would be coded according to these parameters. In terms of the number of categories, the research team decided to use up to three levels of coding categories. The first level categories were to be no more than 10 in total and composed of a maximum of three words. This was done to ensure that the categories would be broad enough to cover the most important points in the interviews (e.g. be exhaustive of the data collected) and to ensure that each was exclusive of the others as suggested by Walter (2010). The second level categories were used to code every aspect of the interviews with respect to each first level

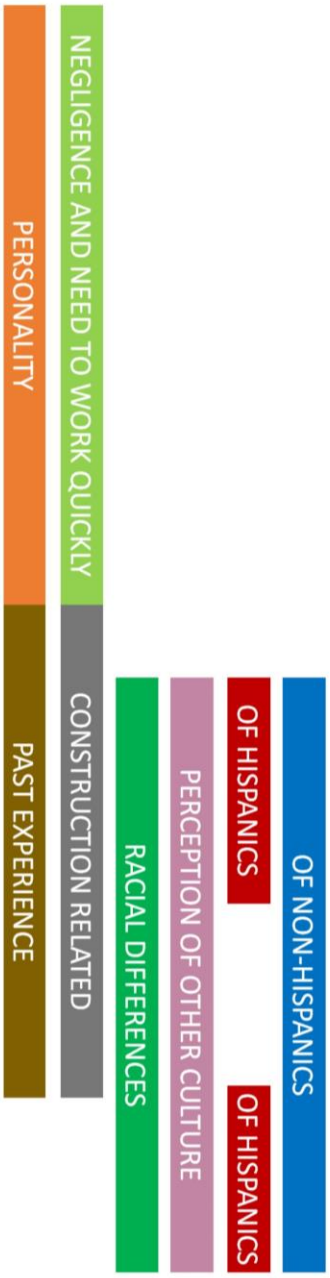
category. The parameters for these categories were not to be more than 5 per each first level category, to be more descriptive than first level categories and to be mutually exclusive. Similarly, third level categories were used to identify and account for repetitive information within the second level categories. These followed the same parameters than second level categories. Finally, codes were developed empirically while reading through the data as suggested by (2013). In addition to the coding categories, another parameter was how the text was going to be coded. In this case the principal rule was to code all the text within all the interviews as this reduced the chance of overlooking information when defining the coding categories.

The second step of the analysis was to decide how to measure the codes. Here, the two alternatives were to code for existence or for frequency (Harding 2013; Walter 2010). Coding for existence means that a category is assigned to a piece only once and it does not account for the recurrence of that category within a singular piece. Conversely, coding for frequency means that every single repetition within a singular piece is marked and accounted for in each category. As a result coding for existence provides a measure of how many times a category was repeated among several pieces while coding for frequency provides a measure of how many times that category was repeated in the entire text evaluated. In this case, the text describing a picture was coded for frequency providing a measure of how many time a code was mentioned throughout the interviews. At the same time, each picture was coded for existence of a category within its respective interview providing a measure of how many pictures were related to a given code.

The third step consisted on defining a way to distinguish among concepts in the coding process. In other words, this provides rules on how the data will be interpreted and coded: explicitly or implicitly (Walter 2010). Explicit coding includes coding verbatim for a set of words, and coding generalizing of looking for similar words that represent the same. Implicit

coding refers to coding not only for literal meaning but also interpreting the text to find non-literal meaning related to the coding categories. In order to minimize bias on the interpretation of data, the interviews on this investigation were code explicitly looking for similar terms that represent the same meaning. The final two steps coding the text and interpreting the result are presented on the following section.

I: Which of these pictures better represents the relationship between safety and culture?
W: This one for example. I took it twice. This part, the yellow part we...we know it should be at this height where this other one is. The one that is normal is this one, this is what is normal, and we all know that it should be at this height. However, we don't care, we only do it to mislead. The superintendent passes and sees it there, but it is not correct.
I: Ok, I'm going to ask you some questions about this picture. What do you see in the picture? What is going on?
W: The mistake we have. The scaffold and this is a, we call it a straight edge.
I: Ok, this is a straight edge, does it prevent you from falling off?
W: Yes, a distraction and...
I: Is it part of the railing?
W: Yes
I: and here, is it too high? Higher than normal?
W: Look here [point to the picture] this is the appropriate height. This is not correct.
I: Ok
W: And, as I was telling you, we already know but we don't fix it.
I: Ok. What does this picture tell us about the relationship between safety and culture?
W: Here, this is an unsafe thing. Because as I just told you this is wrong, a distraction and… But as we said last time, from the Hispanic to the American…As I always say, we, the Hispanic, well in my country, we don't have caution. Because, well because we are not used like that. We are going to climb anyways, even though it [the straight edge] is wrong, and safety does not matter. We are used to that and the American is not. Why? Because they teach them safety since they start working.
I: Since the beginning?
W: Yes, they are better educated. We have to recognize that.
I: Do you have any construction related experience from your country?
W: A little
I: In construction?
W: Yes
I: So do you see any relationship?
W: Yes, it's very different. For example, we went to take a course about forklifts. They showed us pictures about how to operate the forklift, what are we supposed to do, and what we are not. Everybody who was there was learning so that they could do things in a good manner.



First Level Category	Second Level Category	Third Level Category
Personality	Negligence and need to work quickly	
Past Experience	Construction Related	
Racial Differences	Perception of Other Culture	Of Hispanics
		Of Non-Hispanics

Figure 3.3: Coding Sample

Chapter 4

4. Results and Conclusions

4.1. Exploratory Interviews

One of the first issues discussed in the focus groups was that Hispanic workers like to do the job quickly while paying little attention to safety. Many of the foreign born Hispanic workers say that in their native country they are taught to work hard, get their hands dirty, and not to complain. This leads to a fear of saying "no" when they are told to work under unsafe circumstances.

Hispanic workers also find it difficult to understand and follow instructions or to ask questions because of a lack of knowledge of the English language. Workers reported that in some construction sites the translation is poor or not provided, which leads to problems understanding the training materials and rules. Furthermore, workers perceive that non-Hispanics do not want to "waste the time" going through the trouble of communicating with Spanish speaking workers.

Another issue deals with the relationship Hispanic workers have with supervisors, superintendents, and employers. Workers feel that the people in positions of authority simply do not care about them, and their issues. Further, they also explain that during their careers they have had to deal with racism and discrimination at the jobsite.

Lastly, the Hispanic workers acknowledge several family-related issues. On the positive side, the workers noted that they feel compelled to return home safely to their families. Unfortunately, there are also negative family-related issues. First, many Hispanic workers are in their high-risk trade because they need the money to feed their families. Additionally, they are more likely to bring their personal and family problems to work, which causes distractions and feelings of anger that can negatively impact safety.

4.1.1. Photovoice Prompts

The Photovoice prompts were created based on themes of challenges identified from literature and from the focus group discussions. The research team was careful to ensure that the prompts were not overly restrictive so that additional challenges could be introduced and discussed.

Prompt 1: Please capture the impacts of their personal relationships and life on safety and when these played a role in safety related decisions. Personal relationships may include family, friends, and coworkers and personal issues could be anything that happens outside work that could also impact safety performance.

Prompt 2: Please capture how personal values and personality affect safety related decisions. Examples may include machismo, pride, respect, shyness, and attitude towards risks.

Prompt 3: Please capture past experiences and identify differences between the US and your home country that impacts safety.

Prompt 4: Please capture relationships with people in positions of authority. This may include any person at the worksite that could offer safety-related guidance, make safety decisions, and punish negative safety behavior.

4.2. Photovoice Interviews

The prompts elicited a total of 188 pictures from all the 17 workers (an average of 11 pictures per worker). Workers were each asked to select the four most compelling photographs for in-depth discussion with the researcher. In total, 63 photographs were used in the discussion. The reasons given for selecting the four photographs were that they most clearly depicted what the workers wanted to say and reasons for discarding the others were mainly because they showed repetitive information, or were poorly taken.

4.2.1. Coding Categories

The analysis of the interviews yielded 57 coding categories among which there are 9 first-level coding categories, 33 second-level coding categories, and 15 third-level coding categories arranged as shown in Table 4.1 below.

Table 4.1: Coding Categories

First Level	Second Level	Third Level
Communication	Communication between Spanish and English speaking/Barrier Caused by Language	
	Communication between Spanish speaking people only	
	Lack of communication or Poor Communication	
Past Experience	Construction Related	
	No Past Experience	
	Work Conditions in Past Experiences	
Personal Relationships and Life	Family	
	Personal Life	Issues
		Need
	With English Speaking Co-workers	Bad
		Good
	With Spanish Speaking co-workers	Friends
		Union
		Unknown People
Personality	Acceptance of a more dangerous work	
	Attitude toward criticism	
	Machismo and Pride	
	Negligence and Need to work quickly	
	Trust	

Table 4.1: Coding Categories (Continued)

Possibilities for improvement	Desire for improved communication	
	Desire for recognition	
	Desire for respect	
Racial differences	Perception of other culture	Of Hispanics
		Of non-Hispanics
	Discrimination and Racism	Non-Hispanics to Hispanics
		Hispanic to non-Hispanic
		Between Hispanics
	Lack of trust between races	
	Acceptance -No racism	
Relationship with authority	Reaching out	
	Perception of authority	
	Type of interaction	
Safety Awareness	Acknowledgment of importance of safety	
	Acknowledgment of positive safety practices at job site	
	Unsafe Behavior	
	Poor hazard recognition	
Work Conditions	Work Environment	Poor work conditions
		Good work conditions
	Unfair work distribution	
	Pressure	
	Exposure to climate Conditions	

The coding frequency was measured by the number of participants talking about a specific category. Figure 4.1 below shows the coding frequency for all first level categories. Here, personality was the most cited category with 88% of the participants followed by personal relationship and life, safety awareness and work conditions each with 76%. Figure

4.2 shows the most mentioned second level categories. Ten participants discussed things related with a personal need to do the job quickly which leads to a negligent behavior. Eight workers described their personal relationships with other Spanish speaking co-workers, especially friends, as a safety challenge. That same number of workers acknowledged that good safety practices are an essential part of the job; however, eight workers reported that general unsafe behavior is a big problem. Finally, one issue that negatively impacts general communication at the jobsite is how worker perceive people of a different culture. This last issue was also mentioned by eight participants. The following sections explain this results in more detail.

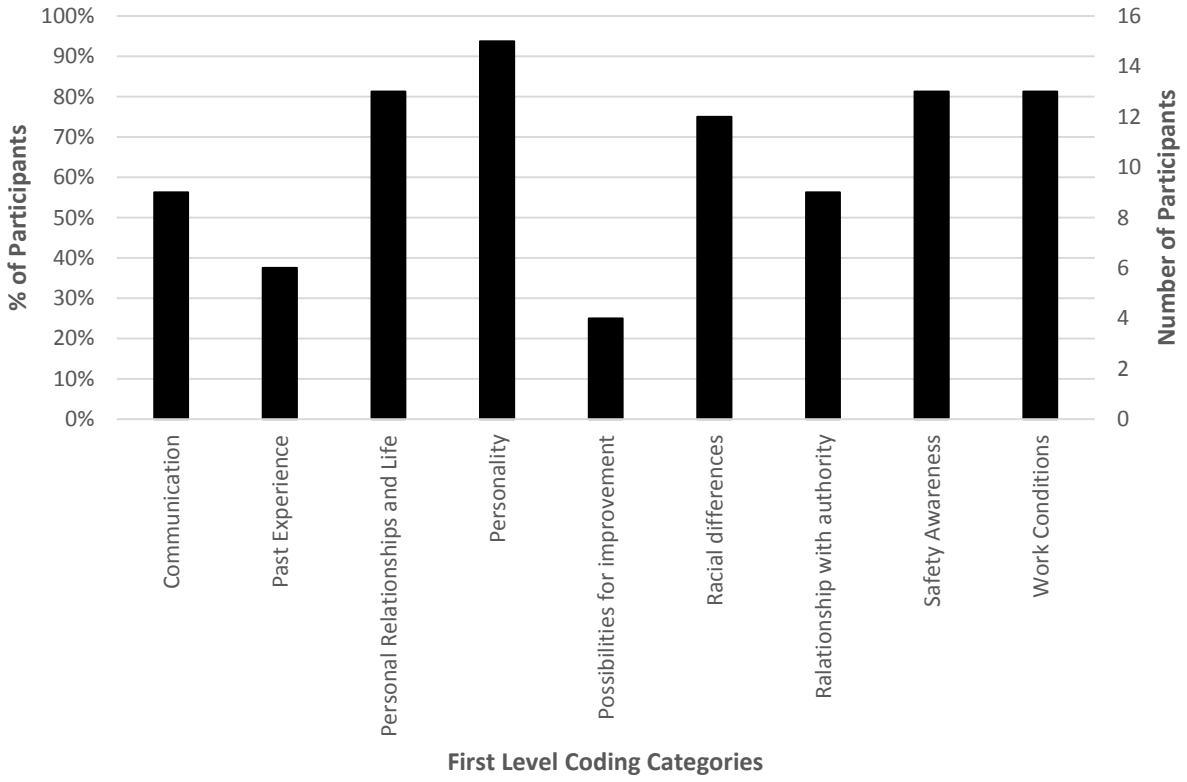


Figure 4.1: First Level Categories Coding Frequency

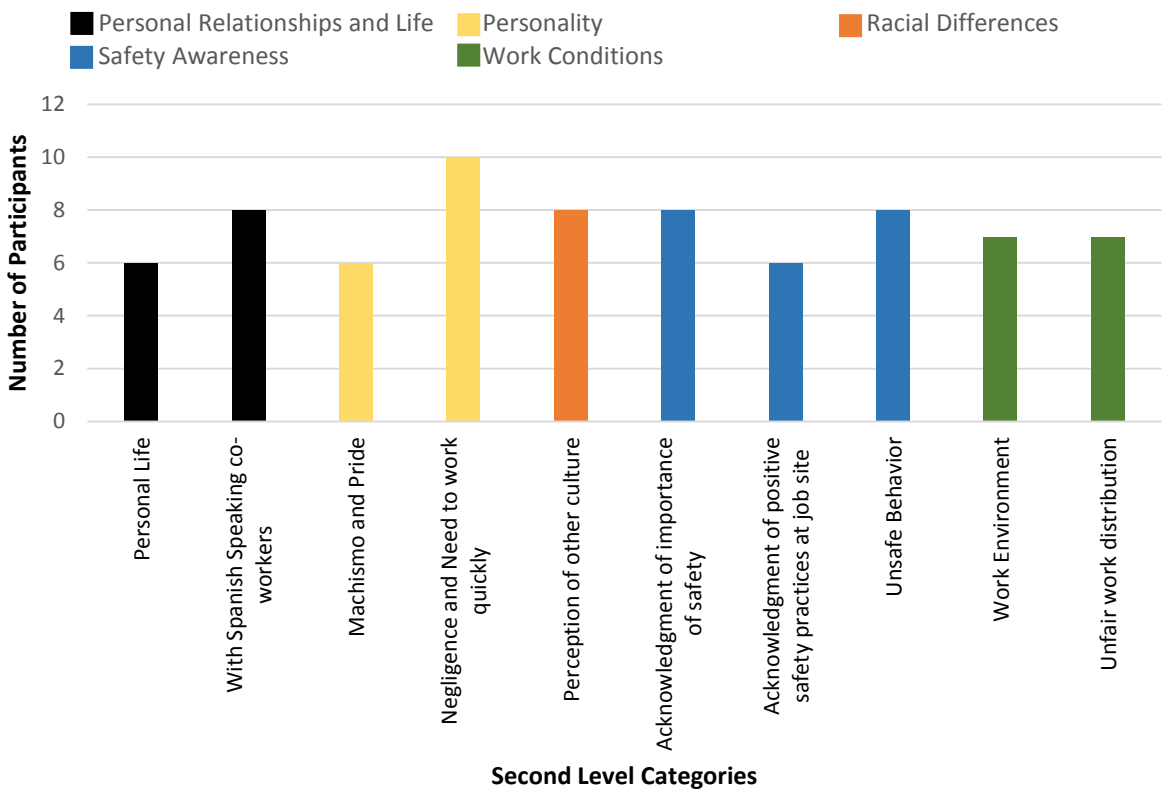


Figure 4.2: Second Level Category Coding Frequency

4.2.2. Personality

Fifteen workers mentioned this category during the Photovoice interviews. Among those fifteen, ten workers described a need to start and finish the job quickly, with daring attitudes that result in cutting corners, neglecting safety rules, and not implementing appropriate safety practices. One worker, for example, captured the two pictures below where he wanted to show a properly (Figure 4.3) and a poorly (Figure 4.4) installed scaffold side railing. The picture represents a safety risk to all workers using the scaffold because it is installed at a high elevation and a person could easily fall through. When asked for the reasons behind such situation he replied: "we all know that this [pointing to Figure 4.3] is the correct height. However, we don't care, and we do it only to mislead. The super passes by

and sees that it is there, but it is not correct." This not only shows negligence but also a complacent attitude where workers do certain safety related tasks only because they are required to and not because they perceive them as something that can prevent injuries.

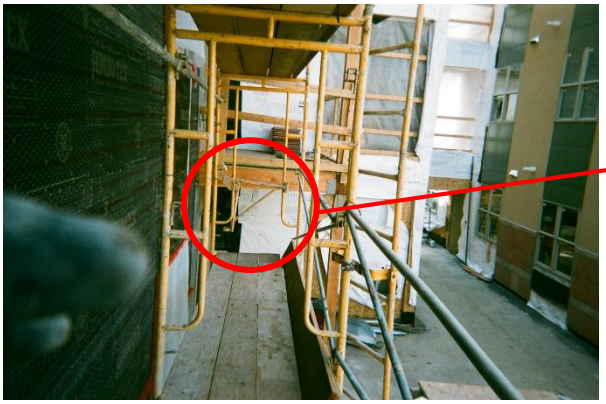


Figure 4.3: Scaffold Railing Proper

Worker shows a scaffold's side railing (inside red circle) installed at an appropriate height where it can protect workers from falling off.

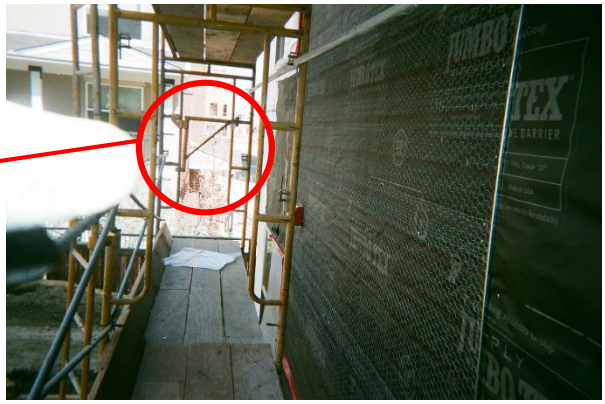


Figure 4.4: Scaffold Railing Improper

Worker shows a scaffold's side railing (inside red circle) installed higher than it should be. Side railing cannot stop workers from falling through.

Another personality related safety challenge among Hispanic construction workers deals with machismo and pride, which both result in careless decisions, not reporting injuries, and not asking safety related questions when required. Six workers mentioned machismo and pride as a safety challenge in construction sites. They explained that many Hispanic workers believe that they are so strong that they will not get injured, or that they know everything there is to know about safety and will not acknowledge that someone with more experience or expertise may offer better safety solutions.

One additional challenge that is in part due to machismo is a bad attitude towards criticism. Six workers mentioned this category during their interviews. Hispanic workers value their coworkers, as discussed in following sections, but there is a fear of a bad reaction to criticism. The issue is even more complicated when the two workers are not familiar with

one another. For instance, a participant worker (worker A) took the picture in Figure 4.5. Here, he was installing the scaffold's walking surfaces when the man in the circle (worker B) started performing work at the ground level in the same location. Worker A asked worker B to move because the boards Worker A was using above could fall down and hit him causing an injury. In response, worker B ignored worker A's request and proceeded in an unsafe manner for 20 minutes. Worker A explained that it is common that he deals with a similar attitude from an unknown person.

Figure 4.5: Bad Attitutde Towards Criticism During Scaffold Installation

Worker at ground level (inside red circle) ignored co-worker's request to move because scaffold was being installed and boards could fall off causing injuries.

Another example can be found in Figure 4.6. Here, the participant worker shows an electricity distribution unit with many connected cords. At the time the picture was taken,

water would get inside the building under construction during rainy days. On one such day a worker one story above the distributor was sweeping the water from his work zone and dumping it straight into the distributor causing a risk for an electrical release. The participant worker, who was a carpenter passing by, told the sweeping worker to be careful and to sweep the water to a different area. Similar to the previous scenario recorded by a different participant, the worker sweeping the water did not heed the warning and continued to work unsafely until the superintendent intervened. The carpenter explained in his experience Hispanic workers tend to ignore criticism when they are doing something wrong mainly as a result of "machismo and pride, because they think they are too beasts."

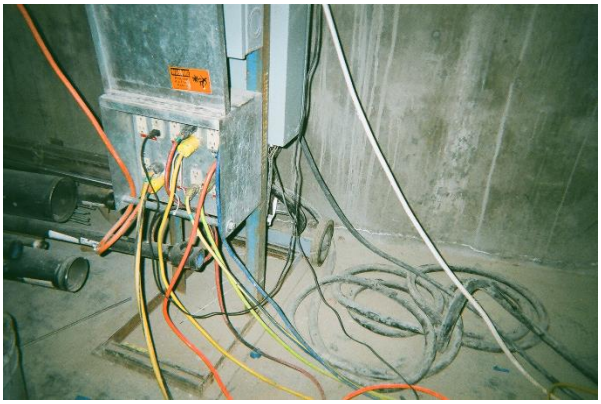


Figure 4.6: Cable Box Poor Attitude towards Criticism

Worker ignored co-workers request not to sweep water to the electricity distribution unit shown in the picture.

4.2.3. Work Conditions

Thirteen participant workers mentioned their work conditions as a perceived safety challenge. Specifically, seven workers cite unfair work distribution. Participants acknowledged that Hispanic workers usually work on some of the most dangerous trades in the industry and that they are assigned harder work than non-Hispanic workers. Although the workers were not asked about their immigration status many explain that Hispanic workers who are illegally employed tend to accept any kind of job and will not to complain

for fear of losing their jobs. Among workers who have legal status, favoritism towards non-Hispanics is one of the main reasons why Hispanic workers are hired for the tougher and riskier positions. One worker, for example, took the picture shown in Figure 4.7. The photo depicts a worker who is spotting an excavator that is loading an adjacent truck on a very cold day. The participant explained that Hispanic workers are more often assigned this kind of dangerous job and exposed to poor weather conditions, while non-Hispanics stay indoors or work on the equipment with heat or Air Conditioning. In the worker's perspective, a better work distribution would be that everyone involved with the task shared the harder assignments in turns. When asked why Hispanics are chosen to do this kind of job, the worker explained: "When we come and apply for a job, we say that we are labors and that we are willing to do anything. When Non-Hispanics come and apply they write down operator even though they don't know how to operate the equipment. When they start the job, the bosses see that they don't know how to use the equipment and they give them chances so they can learn while we, who have been here longer, don't get those same chances."

Figure 4.7: Unfair Work Distribution Example

A Hispanic worker is spotting an exactor in a cold day. Participant worker explains that Hispanics are more prone to receive this kind of tasks than non-Hispanics.

One final safety challenge related to the work conditions is the overall work environment discussed by seven workers. Often, workers do not have the equipment readily

available but they are pressured to do the job quickly. Under such pressures workers improvise and use their own strength when proper equipment is unavailable. This is usually the case when workers have to move heavy materials from inventory to the point of installation. Although Hispanic workers are not the only ones facing this problem in the construction industry, the difference, according to the workers, is that Hispanic workers do not raise concern to each other or to management as one worker explained with Figure 4.8 and Figure 4.9. Here, the worker shows the storage and the final locations of rebar on a highway bridge project. In this case, the workers had to manually carry the rebar to the installation point, exposing themselves to back injuries. The worker explains that: "White people don't like to do much physical effort. While Hispanics, maybe due to our culture, it is like we are imposed to do more physical effort. In Mexico for example, there is not as much technology as here, so we have to put more effort to compensate."

Figure 4.8: Rebar Storage Area

Worker shows the area where the rebar is stored prior installation.

Figure 4.9: Rebar Final Placement Location

Participant worker shows the deck of bridge where the rebar has been placed in its final position. The worker explained that Hispanics are less careful than non-Hispanics when carrying heavy loads around the site.

Another similar issue deals with the lack of appropriate materials to do the job safely. This, in combination with time pressure and the Hispanic characteristic to finish the job quickly, results in improvised work conditions that do not work and create a greater exposure to risks. The two pictures below show an example of this type improvisation. Figure 4.10 shows a worker on top of a scaffold without a walking surface and Figure 4.11 shows a worker on top of the scaffold using improvised 4x2 boards as the walking surface. The participant who took these pictures, explains that they had to work under these conditions for a couple of hours until the appropriate materials arrived.

Figure 4.10: Improvised Work Condtions Example 1

Hispanic worker using a scaffold without a walking surface

Figure 4.11: Improvised Work Condtions Example 2

Hispanic worker using improvised 4x2 boards as scaffold's walking surface

4.2.4. Racial Differences

Racial differences were discussed by 12 workers and can be analyzed from two main perspectives. The first relates to how Hispanic workers perceive non-Hispanic workers. One worker for example, explained that Hispanic workers sometimes hold non-Hispanic workers in a high regard, and believe that non-Hispanics deserve more respect. This makes communication, especially safety related constructive criticism from Hispanic to non-

Hispanic workers, difficult to achieve. Hispanic workers also believe that non-Hispanic workers are overly cautious and, although they recognize that this is a proper work procedure, they were not raised or educated to act in that manner.

The second perspective deals with how Hispanics feel that they are disregarded by non-Hispanic workers. Figure 4.12 below shows a scaffold were a Hispanic crew was working in the exterior of the building. The participant worker explained that in his almost 12 years of experience, he had not seen many non-Hispanic workers climb the scaffold. When asked why Hispanic workers are chosen for this kind of job, the participant replied that it might be because it is easy to complete. The Hispanic participants noted that they believed that non-Hispanic managers in charge of hiring workers think that Hispanics are "dumber" than non-Hispanics, hence the differentiation of work.

Another example can be found in Figure 4.13. Here, the operator of the forklift got the equipment stuck into the mud hitting the neighbor's fence in the process. At the time of the incident, the worker who took the picture was working on top of the scaffold to the left with his crew made up of only Hispanic workers. According to the worker, the superintendent, who was a non-Hispanic, asked the crew to get down and stay away from the forklift while the operator tried to move it. However, he did not ask the same to other non-Hispanic workers who were working nearby. According to the worker, this shows the mistrust from non-Hispanic management, which sometimes translates into mistrust from the workers to management. Such a situation may reduce cooperation and communication between races in the entire job site.

Figure 4.12: Hispanic Crew and Scaffold

Participant explains that not many non-Hispanics work up in scaffolds. He believes that one reason might be that this is an easy job and non-Hispanic managers assign it to Hispanic because they might think they are "dumber".

Figure 4.13: Forklift Near Scaffold

Hispanic workers were asked to keep out of a forklift stuck in the mud while non-Hispanics were allowed to stay demonstrating, according to the participant worker, a lack of confidence on Hispanics.

Another factor dealing with racial differences is the issue of discrimination and racism. According to five workers, the skin color and the fact that they speak Spanish is one perceived contributor to Hispanic workers being chosen to do the dangerous work; although, they recognize that in Colorado this issue has gotten better in the last few years. In addition, two workers mentioned discrimination among Hispanics. This issue occurs when one Hispanic worker asks or tells another about something that is being done wrong or unsafely as shown in Figure 4.5 and Figure 4.6. This bad attitude makes workers feel disregarded,

and unimportant limiting their contribution at the jobsite only to those people with whom they are most confident.

4.2.5. Personal Relationships and life

Thirteen workers described challenges related to personal safety and personal life. Out of these, eight workers mentioned the connections among Hispanic workers, especially among those who work on the same crew and have developed a friendship, as a daily challenge. Following Hofstede's (1980) cultural characteristics that Hispanic people place the people who are close to them in high regard, the participant workers who mentioned friendship showed concern for their friends' safety. The workers recognized that it was very important for them to take care of their friends, to cover each other's' backs, and to work as a team for the team's own good. Although most of the time, this way of thinking represents an advantage, one big challenge arises at the time of speaking up. One worker, for example, explained: "we always try to cover each other when we are exposed to danger. Sometimes however, to get along with a friend, [we think] I'm not going to tell you anything because we are friends. You are going to feel bad." Workers think that a close and trusting relationship *should* make it easier for a friend to understand that the criticism is for good but, unfortunately, criticism is rare and taken poorly. Sometimes the fear of upsetting the friend is greater than the concern for his own safety. Furthermore, despite discussions in the interviews, no photos showed criticism to a friend. However, a few showed criticism to a strange Hispanic person, even though this represents a greater risk of getting disregarded, ignored, and discriminated.

Another relationship issue focuses on the Hispanic non-Hispanic relationships. Four participants pointed out that they are uncomfortable with such interactions because they do not know how a non-Hispanic person will react. Hispanic workers assume that if they say

something is wrong to a non-Hispanic this person will listen. However, when we asked if they actually ever talked to a non-Hispanic worker they replied that never. The only non-Hispanic worker participating on this study took the picture below (Figure 4.14). Here, the operator, a non-Hispanic worker, left the cab of the forklift while the basket was risen and had a stack of material on top. The worker explained that the closest ones to the scene were a group of Hispanic workers, and that even though they were under the risk of being injured with a forklift failure they did not speak up. The main argument of this worker was that "sometimes Hispanics may not mention something. They don't speak up, they don't look out for the other guy."

Figure 4.14: Forklift without Operator

A forklift operator left the cabin with the forklift operational and a Hispanic crew nearby did not speak up even though they were at risk of getting injured.

Another issue relates to a worker's personal life and its relationship to safety. The main issues that as many as nine participants raised was the dire need for employment, a need that they feel is greater than their non-Hispanic counterparts. Hispanic workers need to provide for their families and often send money back to their home country. Also, since many are foreign born or even illegally employed, they are not eligible for unemployment and other government programs if they were to lose their jobs. They explain that necessity increases willingness to take any kind of job, no matter how hard or risky. One example of

the role of necessity in construction safety can be found in Figure 4.15. The house shown here is a weekend job for a crew of carpenters who work full-time at a larger project during the week. When asked why they took this job, the worker who captured the image explained that they needed the extra money. Although the worker did no mention of safety when answering the questions for this picture, one thing to consider on this case is the physical and mental toll that working 7 days a week in a tough job puts on the crew. Very few people can moonlight without detrimental fatigue and ill effects that range from heart disease to psychological issues (Hallowell 2010).

Figure 4.15: Weekend Job

A regular weekend job of a Hispanic crew that works full time during the week.

4.2.6. Safety Awareness

Thirteen workers mentioned safety awareness in their interviews. The discussions involved how workers perceive and tolerate safety risk. Up to eight participants acknowledged the importance of safety for their own well-being and that of their families. They agree that they need to change the way that they behaved in their home countries and adapt to what is expected in the US. Other six workers acknowledged that companies are genuinely concerned for their safety and well-being. As such, they accept safety requirements

and accept that things such as morning stretches, safety training, and pre-job safety meetings are important.

Nevertheless, eight participants recognized unsafe behaviors and violations of safety rules. According to one participant, they would listen to music on their cell phone speakers until the superintendent banned music from the site because it was a distraction that prevented them from hearing what was going on around them. Rather than following the rule, the following day, the workers wore headphones instead, which resulted in even bigger distractions and isolation. The worker who took the picture shown in Figure 4.4 for example, explained that sometimes they meet the safety requirement in a very superficial and temporary way as to satisfy their manager.

4.2.7. Relationship with authority

Not many workers considered the relationship with their bosses a challenge in construction safety. Among those who recognized an issue with authority, four workers, the focus was on how they perceive authority. For example, participants mentioned that sometimes they feel that their supervisors are more concerned about the well-being of non-Hispanic workers. As a result, workers are not very willing to communicate with their superintendent and are sometimes jaded. It should be noted that not all participants noted this and some workers explain that they have strong and mutually-respectful relationships with their supervisors. These workers see the superintendent as someone who can give advice, and who treats them as brothers.

4.2.8. Communication

Given that a great deal of past research has focused on the impacts of communication in construction safety, the team placed relatively low emphasis on this category in the present investigation. Nevertheless, many of the topics discussed are related to communication.

There are two main issues that were commonly raised: language barrier and lack of communication. Although related, these two categories were discussed in two distinct ways. First, language is probably the biggest barrier Hispanics construction worker face in safety because it restricts communication among all parties involved in a construction project. Figure 4.16 below for example, shows a Spanish-speaking worker guiding the stack of materials that the crane is moving. According to the worker who took this picture, the worker in the ground is holding a walky-talky and is supposed to communicate with the crane operator at all times. Unfortunately, the crane operator speaks only English and the worker speaks only Spanish. At the moment the picture was taken, the load started moving sideways and another worker who spoke English had to intervene. Another worker explained that the required safety meetings at his site were in English and there were no translators. According to this participant, the workers who can speak both languages are required to translate but many important aspects are lost in translation. Specifically, the participant said: "I can assure you that about 80% of the people who is here does not speak English. When they [English speaking people] laugh we laugh, but about what? Who knows?" When asked if they ever asked for a better translation, the worker replied that no because they feel that the people in charge do not care.

The other issue goes beyond the language barrier and deals with the frequency and effectives of communication at the construction site. In six interviews workers were asked if they raised concern and the answer was always "no". When asked why, participants most often noted that they felt as if the management did not care about their concerns, although they never raised concerns. Furthermore, the problem does not exist only between English and Spanish speaking workers but also among Spanish speaking workers. In Figure 4.17 below for example, a Hispanic worker is discarding debris from the balcony to a container a couple of floors below. In this case, the trash is not an entirely solid material and the wind

was causing some particles to fly around the site exposing other workers nearby. When asked if the worker who took the picture had done anything, he simply replied that no because he did not know the other worker. Four other workers gave similar explanations.

Figure 4.16: Spanish Speaking Worker Helping with Crane

A Hispanic worker tries to communicate with the crane operator through a walky-talky but the worker does not speak English and has to be replaced by an English Speaking worker.

Figure 4.17: Worker Throwing Debris

A worker is throwing flying debris to a dumpster from the third floor of a building causing a risk for other workers of getting struck by a flying object. The participant worker explains that he did not speak up because he did not know the other worker.

4.3. Limitations

One major limitation of this study is the small sample size used. Although Photovoice is limited to small groups and the sample size used in this investigation is appropriate for a photovoice study the results are not enough to conduct statistical analysis. This study contributes to the existing body of knowledge in construction safety by providing valuable in-depth information on the effects of national culture in workers' safety generated and validated by the workers' own view and experience which would be hard to accomplish with other research methods that allow larger sample sizes.

Another limitation of this study is that it does not provide results according to industry sector, company size, or safety policies in place. The study is more focused on the workers' skill level and trade and participant workers were from the industrial, commercial building, and transportation areas. Additionally, although years of experience and age were

collected from the participants this information was used only to provide an overview of the sample population and was not linked back to the worker's opinions.

One final limitation is that this study does not include the views or opinions of non-Hispanic workers or managers with the only exception of the one non-Hispanic worker that was part of a Hispanic crew. As a result, the findings miss the non-Hispanic perception which could provide an opportunity for more critical and neutral opinions.

4.4. Conclusions and Recommendations

The perceived safety challenges faced by Hispanic construction according to the results of this investigation are summarized in Table 4.2 below. The first finding is the need of Hispanic workers to finish the job fast. As described before, past research (Roelofs et al. 2011) found that Hispanic workers face more pressure from management to finish the job faster than non-Hispanics. In this study, the results support this finding but they also show that pressure is not the only factor that makes them do the job fast resulting in a negligent behavior but that there is also a personality factor related to their background. Past experience and education play a crucial role defining this personal characteristics. Furthermore, the fact that they continue to behave the same way they did at their country of origin is directly related to the uncertainty avoidance characteristic of Hispanic countries identified by Hofstede (1980) and described before.

The second finding deals with machismo among Hispanic construction workers which is in part explained by the high Masculinity index for Latin American countries shown before (Hofstede 1980). Similar to past research (Menzel and Gutierrez 2010), this finding shows that machismo negatively impacts safety. Specifically, machismo contributes to a poor reaction towards criticism which limits Hispanic workers from expressing any ideas, comments, or recommendations to other Hispanic workers be these completely unknown

people or close acquaintances. Furthermore, a new finding provided by this study is the effect of this poor reaction towards criticism when the workers are dealing with co-workers with whom they have close relationships. As suggested by the high collectivism index for Latin American countries (Hofstede 1980), Hispanic workers assign high value to these relationships and in order to protect them from these poor reactions they prefer to stay quiet.

A third finding also similar to existent literature (Goodrum and Dai 2005a) is that Hispanics are assigned harder and more dangerous work than non-Hispanic workers. According to the workers this issue is explained by the perception of non-Hispanic managers and supervisors who believe that Hispanic workers are less capable than their non-Hispanic counterparts. According to the workers, this results in Hispanics being assigned to easier trades such as labors and carpenters which are some of the most dangerous trades in the industry. This perception results in a breach between the Hispanic workers and the non-Hispanic bosses where lack of communication and trust are some of the main consequences. The Power Distance cultural dimension (Hofstede 1980) helps further explain this breach as it explains that Hispanic cultures perceive the boss as an autocrat and are less willing to challenge his/her decisions.

Another two findings of this investigation deal with personal realities proper of Hispanic workers. The first is that Hispanics are more willing to accept and take risks at the construction site without raising concern which has been previously discussed in past research (Menzel and Gutierrez 2010). This is explained by the fear of losing their jobs which is directly related to a monetary need as Hispanic workers usually support their families not only in the US but also at their home countries. The second finding is the issue of poor communication. In general, this problem is linked to two aspects. The first, similar to previous research (Alsamadani et al. 2013), is poor communication between Hispanic and non-Hispanic workers which is explained by the language barrier between English and

Spanish speaking workers. The second, new from this study, is lack of communication not only between English and Spanish speaking workers but also among Spanish speaking workers.

One new final finding of this research is the breach between the Hispanic and the non-Hispanic worker populations due to lack of familiarity. Here, participants explain that they hold non-Hispanics in a higher regard than Hispanics because they do not know how they will react if they criticize them or arise concern. Here, Hispanics ask for closer relationships with the non-Hispanic worker following the collectivistic characteristic of Hispanic cultures (Hofstede 1980).

Table 4.2: Results Summary

Findings	Cultural Dimensions	Relationship to past research
Need to do the job fast	Uncertainty Avoidance	Same finding than past research (Roelofs et al. 2011) but identifies personality and background as contributing factors
Machismo	Masculinity Index	Same finding than past research (Menzel and Gutierrez 2010). Contributes that one effect of this behavior is a poor reaction towards criticism
Hispanics are assigned more dangerous works than non-Hispanics	Power Distance	Same finding than past research (Goodrum and Dai 2005a) but explains that workers believe this happens because they are seen as less capable
More willingness to take risks	Personal Reality	Same finding than past research (Menzel and Gutierrez 2010). Explains that this willingness is caused by economic need.
Poor communication	Personal Reality	Same as in past research language barriers are a big challenge (Alsamadani et al. 2013). However, this study also found that general lack of communication is another factor.
Close relationships and attitude toward criticism	Individualism/Collectivism	N/A

Breach between Hispanic and non-Hispanics due to lack of familiarity	Individualism/Collectivism	N/A

From these results some recommendations to improve the environment for Hispanic workers at construction companies are:

- Better understanding of the cultural differences between foreign born and US born workers paying attention to their background, past experience and the time workers have been in the US,
- Provide good work conditions with respectful and equalitarian treatment in order to build trust between the employer organization and the workers,
- Using daily safety meetings to teach workers that the purpose of safety criticism is not to cause harm but to protect each other and that speaking out is encouraged,
- Using daily safety meetings to increase trust between all workers creating a communication bridge between Hispanic and non-Hispanic workers,
- Ensuring that Spanish speaking workers receive full and accurate translation of materials and all communications at the job site, and
- Motivating, encouraging, and prioritizing safety related communications to avoid late reporting or not reporting of injuries.

Given the findings of this and past investigations and the limitations previously discussed, future research should focus on:

- Providing a statistically valid ranking of the challenges identified in this and other studies in order to guide and prioritize the industry's response to the issues.

- Analyzing the relationship between age, years of experience, and time living in the US with this findings in order to understand which challenges are more applicable to non-experienced workers, which challenges can be changed with time given current practices, and which challenges remain the same even after long periods of time working in the industry.
- Studying the relationship between these findings, company size, and safety policies in place in order to assess the effectiveness of current safety practices addressing these safety challenges.
- Including the non-Hispanic worker population in a similar study to compare results between Hispanics and non-Hispanics and identify safety challenges than are not only specific to Hispanics but to construction workers in general.

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