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Safety Issues Among Hispanic Construction Workers

Along the Wasatch Front in Utah

Phavel Israel Loayza Chahuayo

A thesis submitted to the faculty of  
Brigham Young University  
in partial fulfillment of the requirements for the degree of  
Master of Science

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School of Technology  
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December 2011

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## ABSTRACT

### Safety Issues among Hispanic Construction Workers along the Wasatch Front in Utah

Phavel Israel Loayza Chahuayo  
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Master of Science

During the last few decades immigration by foreigners seeking work in the construction industry in the United States has increased dramatically. Of those seeking jobs in construction, Hispanics represent the largest and fastest growing population. The proportion of reportable accidents among Hispanic on-site construction workers in the United States is higher than that of non-Hispanics. This trend of on-site construction accidents is evident not only in states that have traditionally high populations of Hispanics, such as New York, Florida, California, Arizona, and Texas, it is also manifested in the State of Utah. This research focused on causes of accidents among Hispanic on-site construction workers along the Wasatch Front of Utah, which includes Brigham City, Utah in the north to Provo, Utah in the south. General contractors, subcontractors, job-site superintendents and on-site workers were interviewed to determine both causes of and solutions to accidents among Hispanic on-site construction workers. Results of this research indicated that some of the major causes of on-site accidents among Hispanics included worker negligence, lack of proper safety training, language barriers, and cultural issues. Suggested solutions include financial bonuses for good safety records, on-site translators, recognition of workers who complete approved training in job-site safety, and worker education on the importance of safety

Keywords: Phavel Israel Loayza, accidents, construction, Hispanic, workers



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I would like to express my gratitude also to my committee for their insight, and direction. Jay Christofferson, Kevin Burr and Mark Hutchings, who spent hours and hours helping with this research project.

Finally I would like to thank my Heavenly Father for my family, they are my strength and motivation.



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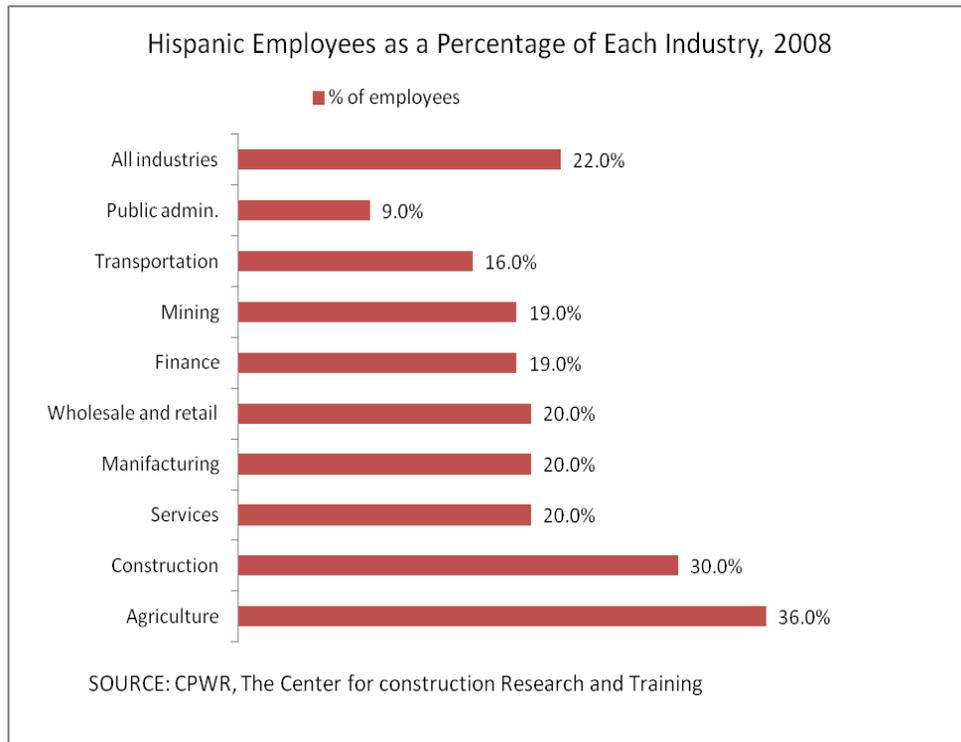


## 1 THE PROBLEM AND ITS SETTING

### 1.1 The Problem Definition

During the last 30 years immigration into the United States has been at historically high levels in what has been called the Second Great Migration Wave (Perlich, 2002). The cause of this demographic phenomenon was the search for better living conditions and job opportunities. In 2001, the United States Immigration and Naturalization Service reported that there were 34.7 million foreign-born persons in the United States, of whom approximately 7 million were undocumented. Currently, some 900,000 foreigners immigrate to the United States each year, including both legal and illegal immigrants; most of these are Hispanic (Brunette, 2004). With regards to Hispanic workers, the construction industry (on-site workforce) in the United States has a larger share of Hispanic or Latino workers than any other industry except agriculture (Dong and Platner, 2003; Dong et al. 2009; BLS, 2010) (see Figure 1-1). During the past 15 years, the Hispanic work force in construction has been continuously growing (Dong & Platner, 2003; Dong et al., 2009; Goodrum, 2004; Pransky et al., 2002). For example, from 2001 to 2007 the total number of Hispanic construction workers in the United States more than doubled, from 1.3 million to almost 3 million (Brunette, 2004; CPWR, 2009). Additionally, the Center to Protect Worker's Rights compiled a list which showed the participation of Hispanic construction workers performing selected tasks on construction projects (see Table 1-1). Note that 33 percent of the respondents indicated that they installed drywall, while 31 percent installed tile products.

Other trades performed by more than 20 percent of Hispanic construction workers included concrete, painting, and roofing. Note also that respondents were allowed to indicate any construction tasks that they performed.

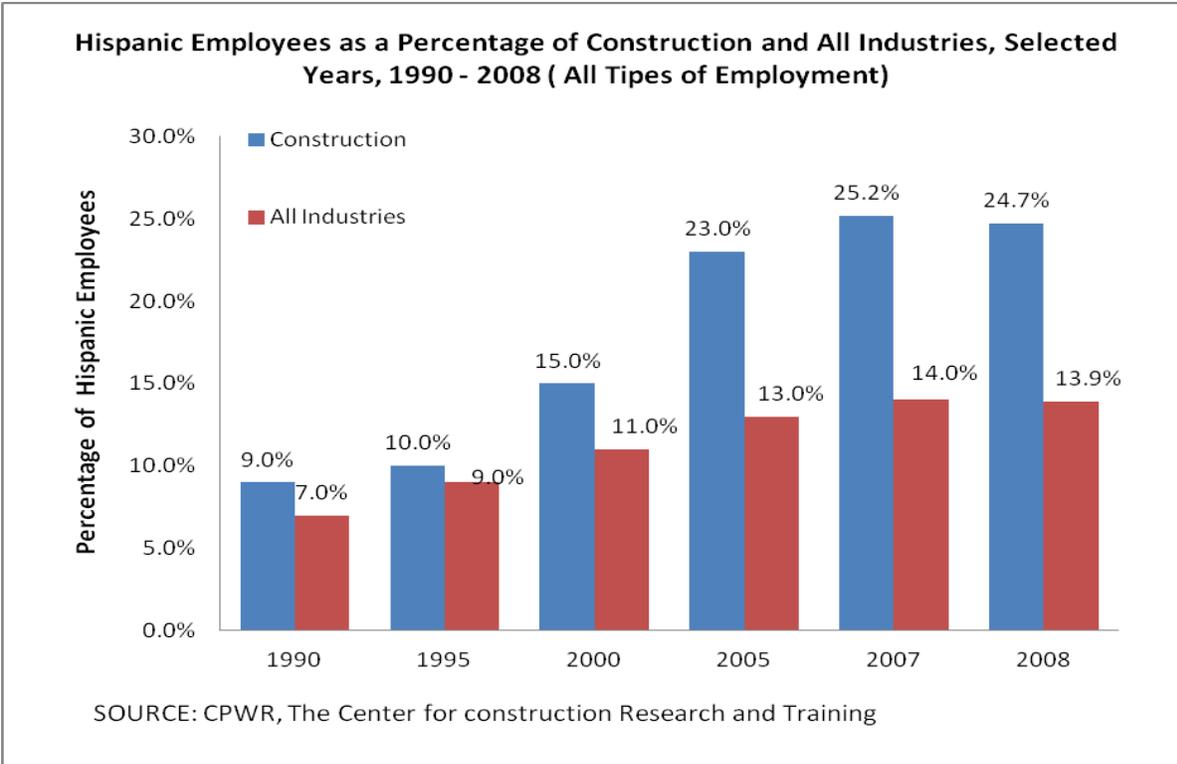


**Figure 1-1: Hispanic Employees as a Percentage of each Industry**

**Table 1-1: Hispanic Construction Workers as a Percentage of Selected Occupations**

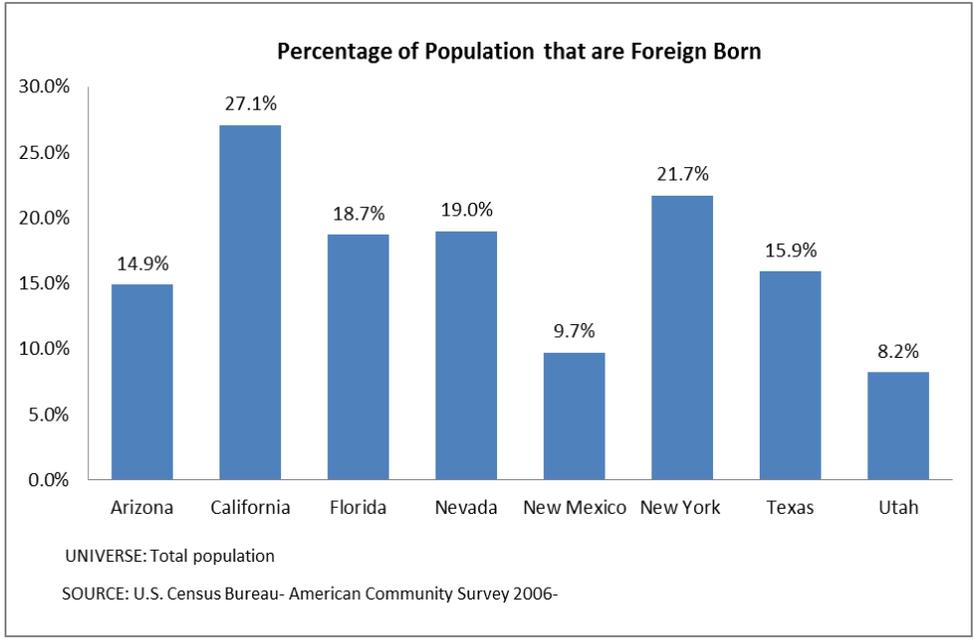
<b>Percentage of Hispanic Construction Workers Performing Specific Tasks Within the Industry. Note Some Workers Responded that They Engaged in More than One Task.</b>	
<b>Occupation</b>	<b>%</b>
Drywall installer	33
Tiler	31
Concrete worker	27
Painter	26
Roofer	23
Laborer/helper	21
Bricklayer, mason	18
Not classified	17
Welder	16
Carpet Layer	16
Repairer	14
Plumber	12
Truck driver	12
Heating/ air conditioning mechanic	11
Electrical worker	9
Source: Center to Protect Workers' Rights 2002	

Even though the United States has faced serious economic challenges, including rising unemployment during the last few years, the percentage of Hispanic immigrants has continued to increase, especially in the Southwest (Goodrum, 2004; Perlich 2008, 2). The majority of Hispanic immigrants into the United States have traditionally sought employment in blue-collar occupations, such as agriculture, manufacturing and construction. During the last 15 years, the construction industry has experienced a huge increase in Hispanic workers. This incremental change is so substantial that whereas in 1990 Hispanics represented approximately 9 percent of all employees in construction, less than 20 years later, in 2008, the percentage of Hispanic construction workers represented 24.7 percent (see Figure 1-2). That means that virtually one-fourth of the construction workers in the United States were Hispanic or Latino in 2008.

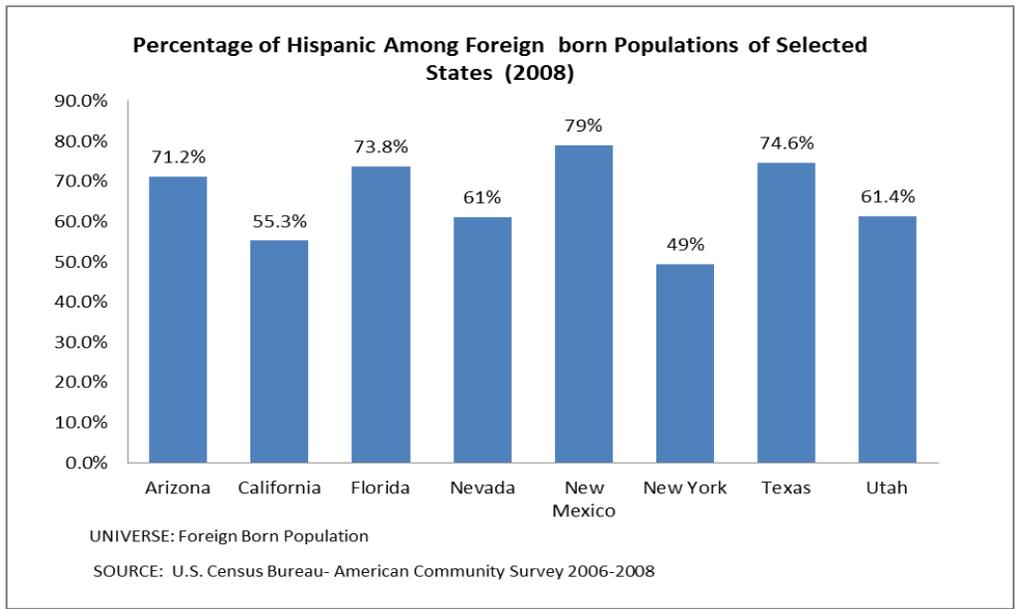


**Figure 1-2: Proportion of Hispanic workers Compared to other Industries**

This incremental change has been more obvious among states with high percentages of foreign-born populations, including California, Nevada, Texas, Arizona, New Mexico and Utah in the West and New York and Florida in the East. In all but one of these states, the majority of the foreign-born populations are from Latin America (see Figures 1-3, 1-4) (U.S. Census, 2010).



**Figure 1-3: Foreign-born Population Rates of Selected States**



**Figure 1-4: Percentages of Hispanics among Foreign-born Populations**

Pamela S. Perlich, Senior Research Economist and member of the Bureau of Economic and Business Research at the University of Utah wrote an article about the demographic transformation of Utah in relation to the foreign-born population. In this article she shows that since 1900, the growth rate among the foreign-born population in Utah reflects the overall trend of the United States (see Figures 1-5, 1-6). Another important factor that Perlich noted was the distribution among the ethnic groups in the State of Utah (see Figure 1-7). According to her research, in 2007 the majority of the total foreign-born population in Utah was from Latin America (62 percent). At the same time, ethnic minorities were estimated to be 18 percent of the total Utah population, while ethnic minorities in the United States represented 35 percent of the total. By 2050 these ratios are expected to increase to 41 percent and 54 percent, respectively (Perlich 2008, 1).

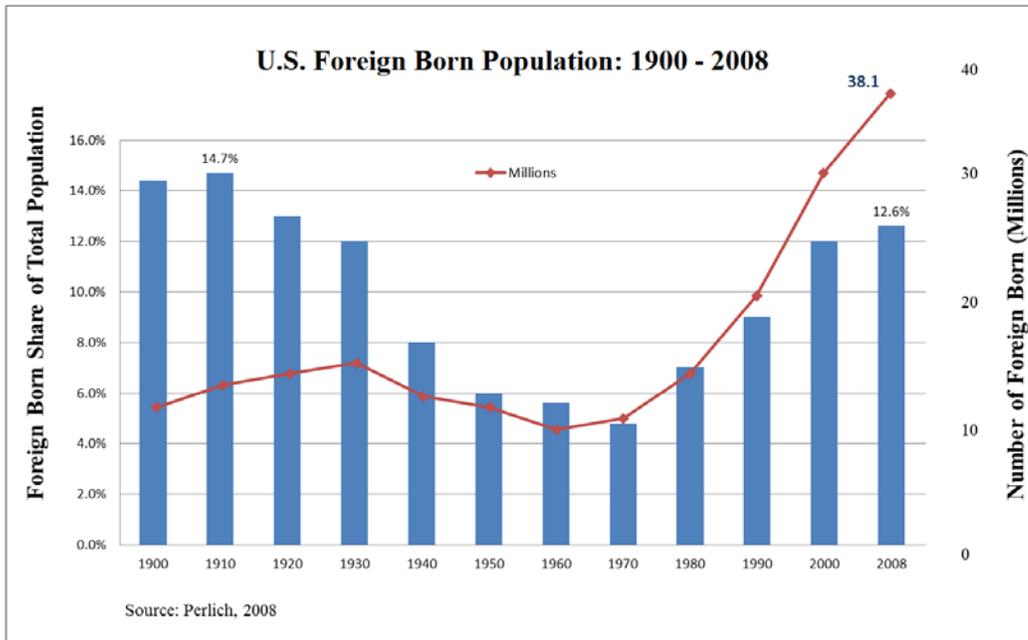
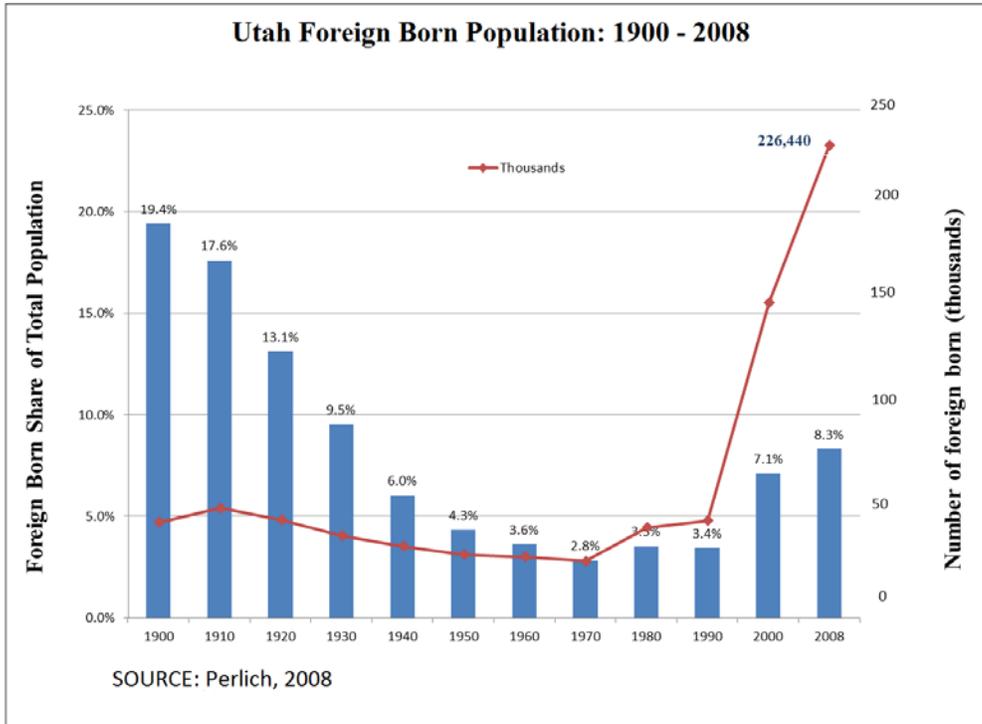
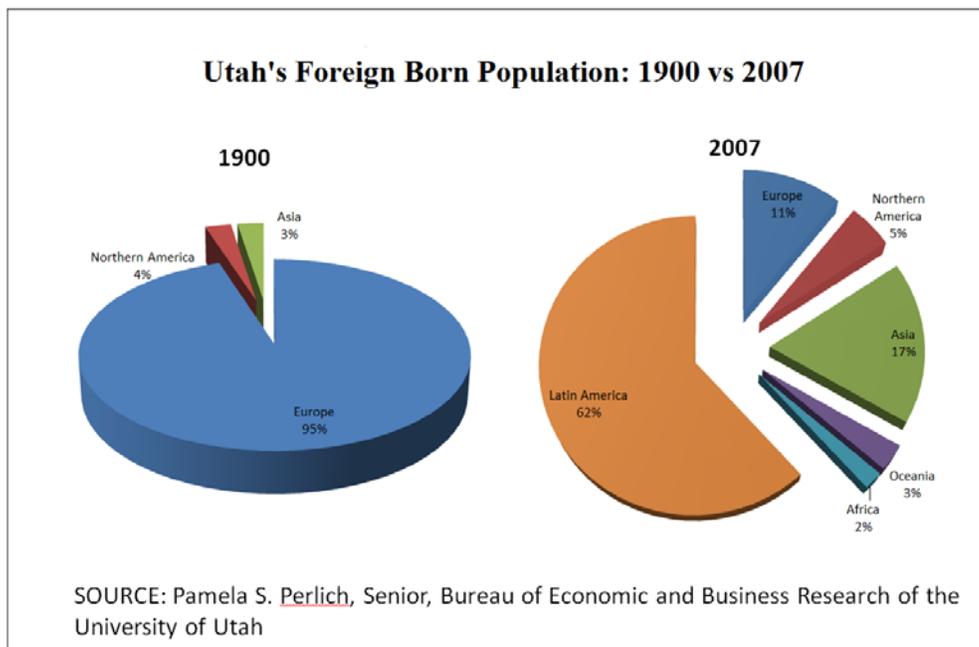


Figure 1-5: U.S. Foreign-born Population 1900-2008



**Figure 1-6: Utah Foreign-born Population 1900 – 2008**



**Figure 1-7: Utah Foreign-born Population Comparison between 1900 and 2007**

## 1.2 Hispanic Construction Workers and Job-Site Safety

The high proportion of Hispanic on-site construction workers has brought new challenges in safety management for construction companies in the United States, especially in relation to reportable accident issues. The reportable accident rates during the last 15 years in the construction industry have been increasing at an alarming rate among Hispanics (Lavy, Aggarwal, and Porwal 2010; Stakes, 2006). In an article published in the *Journal of Occupational and Environmental Medicine*, the authors stated the following: “The inherent danger of working in the construction industry is a reality for all workers, regardless of ethnicity; however, Hispanic construction workers in some studies have been found to have especially high morbidity and mortality” (Anderson, Hunting, and Welch 2000). Studies clearly demonstrate that Hispanic workers face a higher proportion of serious injuries, illnesses and fatalities than other U.S. workers. (Anderson, Hunting, and Welch 2000; Dong and Platner, 2003; Goodrum and Jiukun, 2005; Brown, Domenzain, and Villoria-Siegert. 2010). Researchers have also discovered that accident rates are proportionally higher among Hispanic construction workers than non-Hispanic workers because of their customs, traditions, language barriers, and poor skills (Acosta, et al. 2006; Anderson, Hunting, and Welch 2000; Dong and Platner, 2003; Menzel and Gutierrez, 2010; CPWR, 2009; Stakes, 2006). For example, it is estimated that at least one-third of all Hispanic construction workers speak only Spanish (Brunette, 2004).

Western states with high concentrations of Hispanics, including New Mexico, Texas, Arizona, Utah, Nevada and California have experienced higher rates of work-place injuries to Hispanic workers than to non-Hispanic workers (Brown, Domenzain, and Villoria-Siegert, 2010). Elena Bensor, workplace safety manager for The Utah Labor Commission, shared important information about how the state of Utah manages this particular issue of Hispanic

construction accidents. She suggests that accidents among Hispanic construction workers probably result because of the following reasons:

- Hispanic workers don't understand the risk they face in construction.
- In their home countries, Hispanic workers may have made a living in traditional ways (e.g., farmers using simple tools). As a result, they may not be prepared for the type of construction work they find in the United States.
- In their home countries, some Hispanic workers might have worked in settings where safety wasn't emphasized as much as it is within the United States.
- Hispanic workers might not receive adequate on-the-job safety training.
- Hispanic workers often lack communication skills in English. Communication means much more than to just speak passable English; it sometimes requires workers to ask questions for clarification of instructions.
- Hispanic workers are often reluctant to report injuries or unsafe job-site conditions to their supervisors.
- Compared to non-Hispanics, Hispanic workers might not follow safety procedures, because they are in a hurry (Utah Labor Commission, 2008).

Finally, based on the author's own experience, Hispanic or Latino workers are often exposed to high-risk situations in construction. During 2008 and 2009, the author, who is from Peru, had the opportunity to work on several construction projects along the Wasatch Front in Utah. This was an invaluable experience in which it was evident that Hispanic workers here consistently assigned high-risk tasks. In fact, on a few occasions, the author was a witness to serious workplace accidents. The author also noticed that even when the government required specific

safety measures for all workers, it was not clear why Hispanic workers still experienced more reportable accidents than non-Hispanic workers along the Wasatch Front in Utah.

### **1.3 The Statement of the Problem**

The problem is that Hispanic on-site construction workers experience more reportable accidents than their counterparts, non-Hispanic construction workers.

### **1.4 Purpose of Study**

The main purpose of this study is to determine why there are more reportable accidents among Hispanic construction workers than non-Hispanic construction workers along the Wasatch Front in Utah. This study will also determine the most frequent causes of reportable accidents among Hispanic construction workers in the same geographic region. Finally, this study will attempt to identify specific safety training methods or techniques used by construction companies along the Wasatch Front in Utah, especially among the Hispanic workforce, and will provide suggestions to reduce the rate of reportable accidents among Hispanic on-site construction workers along the Wasatch Front in Utah.

## **1.5 Research Questions**

Why do Hispanic construction workers experience more reportable accidents than non-Hispanic workers along the Wasatch Front in Utah?

### **1.5.1 Sub Questions:**

What are the causes that contribute most to job-site construction accidents among Hispanic workers?

What are the most important things that can be done by construction companies to reduce or eliminate job-site accidents among Hispanic workers?

## **1.6 Population**

The population for this study consisted of residential and commercial Hispanic construction workers, general contractors, and subcontractors along the Wasatch Front in Utah.

## **1.7 Limitations**

This research is intended to determine why Hispanic construction workers face more accidents than non-Hispanic workers in the construction industry along the Wasatch Front in Utah. This research is not intended to explain the nationwide concern about this topic; it is specifically a study targeting the Wasatch Front. Also, this research focuses specifically on private residential and commercial construction sectors; state and local government projects are not included in this research. Finally, this research focuses solely on reportable injuries, not minor injuries.

## **1.8 Delimitations**

This study was intended to be limited to residential and commercial construction companies, including general contractors and subcontractors with headquarters along the Wasatch Front in Utah. It will also determine what specific safety methods are implemented by these residential and commercial construction companies for their Hispanic employees.

## **1.9 Importance of the Study**

This research should be beneficial for at least two major reasons. First, important information about the causes of reportable accidents in the Hispanic population along Wasatch Front in Utah will be obtained. As a consequence of this research, the information obtained will be valuable to help control the proportion of reportable accidents in the Hispanic workforce. Second, the result of this research might help to reduce reportable accidents and the even the loss of life in the construction workplace; and at the same time, it might give general contractors and subcontractors more ideas and suggestions to help manage safety among the Hispanic workforce.

## **1.10 Definitions and Abbreviations**

Blue-collar worker: A blue-collar worker is a member of the working class who typically performs manual labor and earns an hourly wage. Blue-collar work may be skilled or unskilled, and may involve manufacturing, mining, building and construction trades, mechanical work, maintenance, repair and operations maintenance or technical installations.

BLS: U.S. Bureau of Labor of Statistics

DAFW: Days Away from Work

Foreign Born: Foreign-born simply refers to persons not born in the United States. The foreign-born population includes legal immigrants and illegal immigrants residing in the United States (Loh and Richardson, 2004).

Hispanic or Latino: Word used to describe a person from Mexico, Puerto Rico, Cuba or another Central or South American countries. Although often described as an ethnic group, Hispanics can be further described based on race, language variations and culture.

NAHB: The National Association of Home Builders

NIOSH: The National Institute for Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

PPE: Personal Protective Equipment

Reportable Accident: According to OSHA requirements, an injury or illness occurring on the job site that meets the general recording criteria, and therefore must be reported. If the incident results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness, it must be reported. A case also meets the general recording criteria if it involves a significant injury or illness occurring on the job site diagnosed by a physician or other licensed health care professional, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness.

Serious Injury: An injury is described by the Bureau of Labor Statistics as serious when the worker misses at least one full day of work beyond the day the incident occurred (Bobick, 2004).

Worker's Compensation: Workers' compensation is a system through which the injured worker is assured by law of a partial income during the period in which he or she is unable to work.



## 2 REVIEW OF LITERATURE

### 2.1 Introduction

This chapter begins with a brief history of construction safety. Following, construction accidents are analyzed. After that, root causes of construction accidents are discussed. Then, a short review of worldwide construction accidents is inspected. Next, this chapter will analyze the problematic issues among Hispanic construction workers in the U.S. which is a review of the factors and the causes of construction accidents among the Hispanic workers. Subsequently, fall hazard deaths observed on residential construction sites are analyzed. At the end a review of construction accidents in the state of Utah is analyzed. The importance of this research is underscored when the people related to the construction industry, general contractors, subcontractors, safety managers, superintendents, workers, etc., begins to understand the necessity to find the causes of the high rate of accidents in the Hispanic workforce. Also it is important to find other alternatives to decrease the rate of reportable accidents, in this specific case the reportable accidents among the Hispanic construction workers in the Wasatch Front in Utah. The loss of human lives as a consequence of reportable accidents in the construction industry is a main concern that gives to this research a high level of importance.

## 2.2 History of Construction Safety

For thousands of years civilizations have been concerned with building safety. In fact, as long ago as 4,000 years, King Hammurabi instituted a civil code and harsh penalties intended to protect the public from unsafe construction practices. “If a builder builds a house for a man and causes the death of the owner or his family, the builder shall be put to death” (MacCollum, 2007).

After thousands of years the occupational industry has suffered drastic accidents especially in the construction area. Along the human history there have been certain main events in which man was compelled to incorporate safety measures. This is the case of the Industrial revolution era or after the invention of the train.

With the advent of the railroads, the U.S Railroad Appliance Act was legislated in the 1890s, which required the adoption of self-couplers and Westinghouse air brakes. This concept saved the lives of hundreds of workers and passengers (MacCollum, 2007). However other trials began to afflict the cities; because of the population increment, there was the necessity to develop and build more houses and neighborhoods. This growth and the demand of residential projects have amplified the rate of construction accidents. This is why safety rules and norms in the field of safety construction were established. The U.S. government was one of the first countries in the world to develop and promulgate safety construction measurements. In 1904, the state of Wyoming was the first state in the U.S. to enact a professional engineering license, which established standards of education and experience (MacCollum, 2007). Moreover, it is necessary to highlight that all the safety norms and rules in the construction field are the result of the injuries of thousands of workers throughout the last hundreds of years.

For many years, construction workers thought nothing of operating loud power equipment without wearing hearing protection. As a result, these hearing-impaired retired

construction workers find it necessary to turn up their televisions and radios to deafening volumes in order to hear them, and find themselves missing out on the subtler sounds of life (Heberle, 1998). Today there are organizations and government institutions that seek to regulate and control job sites in order to reduce construction accidents and save the lives of construction workers. One of these is the Occupational Safety and Health Administration (OSHA), an agency of the United States Department of Labor. Its mission is to prevent work-related injuries, illnesses, and occupational fatalities by issuing and enforcing standards for workplace safety and health (OSHA, 2011).

### **2.3 Construction Accidents**

In the U.S., the construction industry suffers the highest absolute number of and third highest rate of fatal occupational injuries; it also experiences the highest rate of non-fatal occupational injuries (Dong and Platner, 2003; Jorgensen et al. 2007). Many researchers have studied the causes of construction accidents, and as a result there are many explanations about the high rate of construction accidents. It is important to bear in mind that not only are construction personnel affected as a result of construction accidents; construction companies also lose millions of dollars in penalties imposed and in some cases face criminal prosecution as a result of unsafe work sites and construction accidents. To understand this issue it is necessary to state that the construction industry is different compared to other occupations. Following are some of the reasons why construction accidents occur at a higher rate than accidents in other industries.

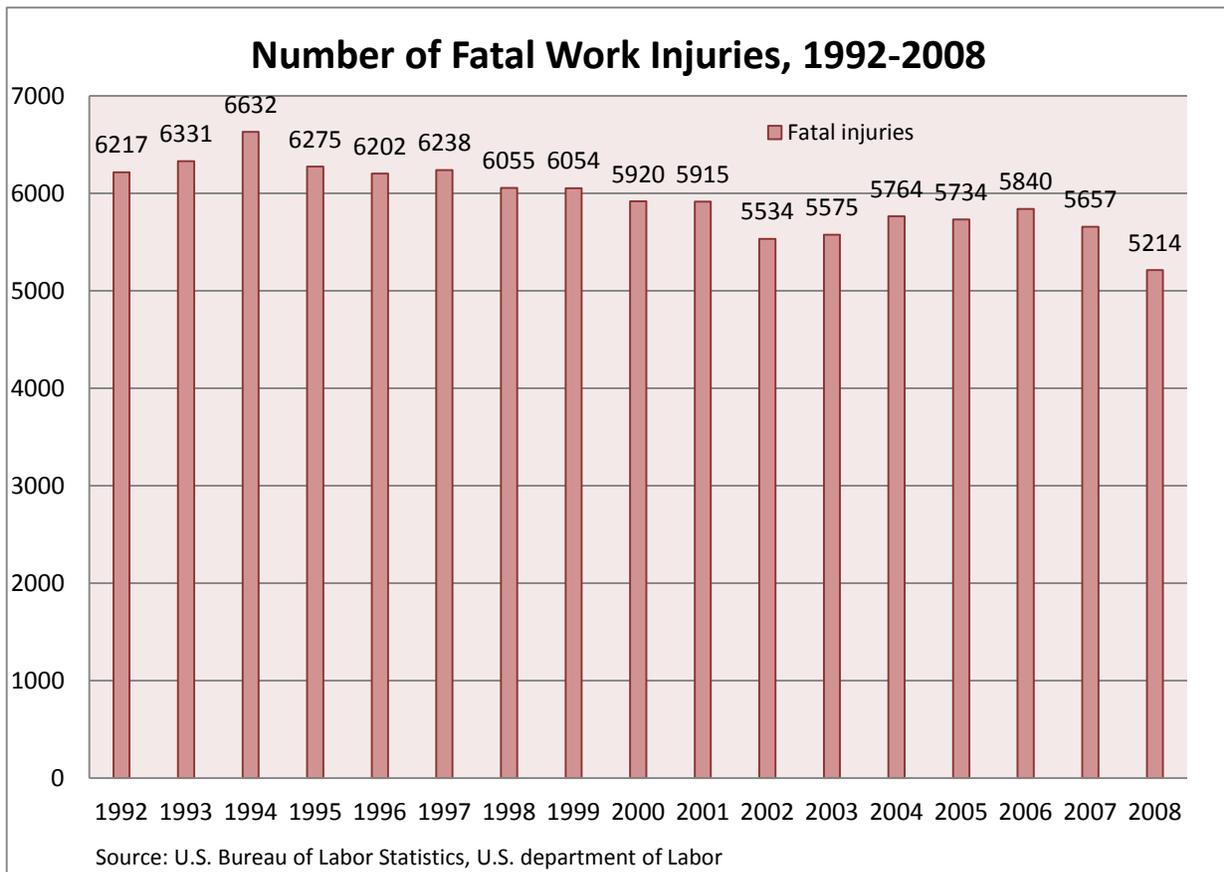
- Job sites are dynamic (constantly changing) as work progresses and different construction trade workers enter in the process.

- Each job site may involve several small contractors (subcontractors) performing different types of work in close proximity to each other.
- Several trades may be represented on the job site at the same time, bringing with them their own specific hazards, such as heavy equipment or potentially toxic products. This creates the potential for all workers at the job site to be exposed to safety hazards, not just those of a specific trade.
- Construction workers frequently change job sites and employers. This results in using new procedures and equipment for which they have not been trained (Reese and Eidson 2006).

Some construction company owners do not consider safety management a priority. This is especially common in third-world countries where the construction company presenting the lowest bid is usually awarded the contract. As a result, third-world contractors sometimes have very low margins in order to win a bid and may compromise job-site safety management in order to speed production. In the construction field there is a commonly used phrase, “Time is money,” and because of this some builders believe there is a conflict between productivity and safety; that is, safe work habits result in a slower work pace (Suruda , Fosbroke and Braddee 1995). Also, some builders think that construction managers should focus only on productivity in terms of time and cost. In their minds, taking the time to implement safety measures usually conflicts with productivity and slows the work, thereby costing the builder more money (Benjaoran and Bhokha, 2010). This dilemma will be addressed later in this chapter.

There are various factors influencing job-site safety management in the construction industry. These factors can be grouped into a number of areas, including the interactions among job-site workers, among organizations, among managers, and so on (Tam, Zeng and Deng 2004).

Some authors affirm that the main cause of construction accidents is because of human error (Johnson, Singh and Young 1998; Mitropoulos et al. 2009; Reese and Eidson, 2006). Regardless of the cause, hundreds of workers die each year as a result of work injuries (Kaskutas et al. 2009; Mitropoulos and Pulido, 2009; BLS, 2010). Figure 2-1 below shows the total number of work fatalities in the United States from 1992 through 2008.



**Figure 2-1: Number of Fatal Work Injuries**

According to Leon Rogers, a prominent construction consultant, the three major reasons contractors should work to avoid construction accidents are: humanitarian, economic and legal (Rogers, 2009). Humanitarian concerns are the most critical, because human safety should be more important than any program or budget. It would be very difficult to be the person who had

to contact the family of a worker injured or killed at the job site as a consequence of an accident. Economic concerns are also important. A number of studies and publications indicate that one of the best ways to increase profits in the construction industry is to implement good on-site safety procedures. For example, companies with a lower rate of accidents pay less for worker's compensation insurance (LaBelle, 2000; Levitt and Samelson, 1993; Rogers, 2009). The third major reason for implementing job-site safety is to avoid legal consequences resulting from accidents. A building company's public image can be seriously damaged or even destroyed by a single accident resulting from careless and unsafe conditions on a job site. It can prove almost impossible for a builder to overcome a negative reputation resulting from a needless fatality due to an unsafe condition. In addition, the adverse publicity can be personally devastating (Levitt and Samelson, 1993; Rogers, 2009).

Traditionally, it has been the role of the general contractor to be responsible for overall safety on the job site. However, it is obvious that the contractor alone cannot deal with every job-site safety issue. Some safety issues arise due to poorly designed safety programs by subcontractors. By requiring subcontractors to apply greater safety measures on the job site, more careful safety planning must be implemented prior to the start of construction. This may be more expensive initially, but in the long term, if the site is kept accident-free, and the facility is also kept accident-free during construction, the savings in time and resources can be significant for both the subcontractors and the general contractor (Lingard and Rowlinson, 2005).

## **2.4 Identifying Root Causes of Construction Accidents**

Construction is one of the most dangerous industries in the United States (Rivara and Thompson, 2000; Suruda et al. 2003; Tam, Zeng and Deng 2004; Waehrer et al. 2007). There are a lot of studies and articles related to the root causes of construction accidents. The construction

industry has a reputation for high accident rates because of the nature of hazardous activities on job sites (Benjaoran and Bhokha, 2010). Identifying the causes of construction accidents is the first step in reducing the frequency of construction accidents. Charles Reese stated the importance of safety and health on the project site. He wrote, “Where does safety and health on a construction site project begin? The answer is of course from day one. When does it stop? The answer is never” (Reese and Eidson, 2006). Even though the importance of safety is acknowledged, the majority of small contractors find it difficult to spend money on job-site safety. Because job-site management focuses primarily on productivity in terms of time and cost, safety usually conflicts with production and is often blamed for hindering the progress of the job thereby increasing costs (Benjaoran and Bhokha 2010; Suruda , Fosbroke and Braddee 1995).

Leon Rogers explained the advantages of using safety measurements in his book *Basic Construction Management*. He says, “Workers’ compensation premiums in the construction industry typically range from a low of about seven percent of direct wages to as much as 60 percent for some trades. The rate varies from state to state, but the rate for rough carpenters is typically 11 percent. Roofing is about 20 percent. That means that for every dollar you pay to your employee in wages you must take 11 or 20 cents out of your pocket to pay workers’ compensation insurance” (Rogers, 2009).

Workers compensation is comprised of two main parts, the manual rate and the experience modification rate (EMR). The manual rate is the rate per \$100 of payroll paid by the contractor for workers’ compensation for each trade. These rates vary based on potential hazards and historical claims associated with each particular job classification. The manual rate is adjusted according to the EMR. Each company that pays workman’s compensation for their employees has an EMR. The EMR is based on the losses sustained by the insurer during the previous three-year period and is expressed as a percentage of the manual premium rate charged.

If a company has a good safety record with few or no worker's compensation claims, its EMR might be .75 or 75 percent of manual premiums. If the company has a poor safety record and many worker's compensation claims, its EMR might be 1.3 or 130 percent. In summary, the worker's compensation premium is based on the following formula:  $\$ \text{ Payroll} \times \text{ Manual Rate} \times \text{ EMR} = \text{ Workers' Compensation Premium}$ .

In other words, successful safety programs can have positive financial impacts for employers by helping to lower the cost of workers' compensation premiums. If the company has a good accident claim record resulting in a low EMR, insurers will charge less for worker's compensation which can save a company money and even provide a competitive advantage when estimating labor costs for a project (Levitt and Samelson, 1993; Rogers, 2009).

As previously mentioned, the number one cause of reportable accidents in the construction industry is human error or personal indifference to safety. To reduce the causes of human errors resulting in construction accidents, regular safety training is essential. Lack of knowledge and training, by both the contractor and the worker, is one of the main causes of reportable accidents (Ahonen, Benavides and Benach 2007; Johnson , Singh and Young 1998). It should be mandatory for a worker to be instructed in safety procedures before entering the workforce. The goal of this type of safety training is to be sure a new worker understands safety guidelines and is qualified to avoid hazardous situations in the workplace. According to one publication (Reese and Eidson 2006), some cardinal safety and health rules are:

- Wear and take care of Personal Protective Equipment (PPE).
- Do not wear jewelry in hazardous areas (e.g. moving machines, areas with electricity) which can hook or catch on protrusions.
- Don't use drugs and alcohol on the job.
- Avoid activities which create a hazard.

- Report to your supervisor any unsafe work conditions or practices.
- Never work on electrical circuits or equipment unless properly trained and qualified.

In addition to the safety guidelines listed above, there are other safety issues that are related to human factors. Some studies concluded that the age of the workers (either too young or too old) is one of the causes of reportable accidents; other studies found interesting relationships between the rate of accidents and a specific day of labor. Every year, the highest number of accidents on construction sites occurs on Mondays. Construction accidents that occur in the afternoon also have a higher probability of being severe or fatal (Camino et al. 2008).

The U.S. Department of Occupational Safety and Health Administration (OSHA) has identified the top nine most-frequent workplace safety violations in construction for 2009. The most common workplace violations for construction workers were:

**1. Scaffolding** – 9,093 violations. Scaffold accidents most often result from the planking or supports giving way, or to the employees slipping or being struck by a falling object.

**2. Fall Protection** – 6,771 violations. Any time a worker is at a height of four feet or more, it is assumed that the worker is at risk and needs to be protected. According to OSHA, in general industry applications fall protection for employees must be provided when they are at least four feet off the ground; in maritime work, the minimum is five feet from the ground; and in construction, workers who are more than six feet off the ground must have fall protection.

**3. Communications Regarding Hazardous Materials** – 6,378 violations. Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import and prepare labels and safety data sheets to convey the hazard information to their downstream customers.

**4. Respiratory Protection** – 3,803 violations. Respirators protect workers against insufficient oxygen environments, harmful dust, fog, smoke, mist, gas, vapor and sprays. These hazards may cause cancer, lung impairment, and other diseases or death.

**5. Lockout-Tag Out** – 3,321 violations. "Lockout-Tag out" refers to specific practices and procedures to safeguard employees from the unexpected startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

**6. Electrical (Wiring)** – 3,079 violations. Working with electricity can be dangerous. Engineers, electricians, and other professionals work with electricity directly, including working on overhead lines, cable harnesses, and circuit assemblies. Others, such as office workers and sales people, work with electricity indirectly and may also be exposed to electrical hazards.

**7. Ladders** – 3,072 violations. Occupational fatalities caused by falls remain a serious public health problem. The US Department of Labor (DOL) lists falls as one of the leading causes of traumatic occupational death, accounting for eight percent of all occupational fatalities.

**8. Powered Industrial Trucks** – 2,993 violations. Each year tens of thousands of injuries related to powered industrial trucks (PIT), or forklifts, occurs in US workplaces. Many employees are injured when lift trucks are inadvertently driven off loading docks, when lifts fall between docks and an unsecured trailer, when employees are struck by a lift truck, or when employees fall while on elevated pallets and tines.

**9. Machine Guarding** – 2,364 violations. Any machine part, function, or process that may cause injury must be safeguarded. When the operation of a machine has the potential to injure the operator or others in the vicinity, the hazard must be eliminated or controlled.

This data is alarming, and it seems more preventive measures could be taken in order to avoid serious accidents. However, this is not a new issue. The National Safety Council reported that in 1996 alone, 1,000 construction workers lost their lives at work and another 350,000

workers received disabling injuries. According to statistical data, the construction industry accounted for only five percent of the United States' workforce but claimed a disproportionate 20 percent of all occupational fatalities and 9 percent of all disabling occupational injuries. In other words, to work in the construction industry is considered one of the most dangerous occupations.

According to Tariq S. Abdelhamid (Abdelhamid and Everett 2000), the majority of construction accidents occur due to three main causes:

- Failing to identify an unsafe condition that existed before an activity was started.
- Deciding to proceed with a work activity even after the worker identifies an unsafe condition.
- Deciding to act unsafely regardless of the initial condition of the work environment.

These three factors accurately identify the root causes of accidents in construction.

First, workers who do not have adequate training or knowledge about their jobs should not be expected to identify all unsafe conditions surrounding their work.

Second, workers who do not have appropriate training or knowledge for their jobs but still decide to work unsafely will never be accident-free unless their attitudes and knowledge about safety change.

Third, management procedures should be designed to identify and remove unsafe conditions in a proactive manner, and management should always reinforce the value and importance of safety among workers (Abdelhamid and Everett 2000).

## **2.5 Worldwide Perception of Construction Accidents**

Due to its nature, the construction industry is among those with the highest rate of accidents in the world (Adam, Pallares, and Calderon 2009; Larson and Field 2002; Tam, Zeng and Deng 2004). In the United States each of the 50 states has its own legislation for safety on

job sites. It is interesting to note that all 50 states in the United States and the majority of the countries around the world use OSHA regulations as a foundation of their own safety regulations. In the following paragraphs, safety issues in a few selected countries will be highlighted in order to compare accident rates outside of the United States.

Spain has some of the highest accidents rates in the European Union (Camino et al. 2008). In Spain, the construction industry accounts for 27.3 percent of all occupational accidents, 36 percent of all serious accidents, and 33.9 percent of all fatal accidents (Adam, Pallares, and Calderon 2009). According to Camino Lopez, 74 percent of the construction work in Spain involves the construction of buildings which is where the majority of fatal accidents occur, accounting for 43 percent of all fatal fall accidents and 35.2 percent of all industrial fatalities (Camino et al. 2008). Like the United States, Spain has been a magnet for immigrants, especially South American immigrants from Colombia, Peru, Ecuador, and Bolivia.

The United Kingdom (UK) has the second largest construction sector within Europe. The UK construction industry is successful in many respects, but with regard to safety it still faces numerous challenges (Howarth and Watson 2009). Another example is China, the Asian Giant. By international standards, the construction site safety record of China is very poor. Every year there are about 1,000 recorded fatalities on construction sites and a large number of reported occupational accidents; however, it is believed that these figures show only the tip of an iceberg, with a large number of unreported fatalities and accidents (Tam, Zeng and Deng 2004). The Chinese government plays an important role in overseeing safety in the construction industry in China. The Ministry of Construction is charged with the task of implementing new strategies and polices to increase safety awareness on the job site. The Ministry works directly with municipalities and has the responsibility for construction site safety. Even with this organization, there are still high accident rates on construction sites. According to some authors, the main

problem in China is the disregard of construction safety guidelines. Most contractors in China do not have a properly documented safety management system laid down clearly in the safety manuals. It is also true that only a small percentage of contractors provide adequate PPE for their workers (Tam, Zeng and Deng 2004).

Finally, third-world countries also face similar problems. Among those is Peru, one of the most emerging countries in South America. According to the INEI, (Instituto Nacional de Estadística e Informática) the construction sector in Peru was predicted to increase 14.4 percent in 2010. Recently the former Peruvian Minister of Economy and Finance, Mercedes Araoz, was interviewed by the cable news CNN (Cable News Network) and mentioned that Peru was the country with the best economic performance around the world during the times of recession in 2009. Notwithstanding of improvement in the Peruvian economy, accidents in the construction industry have been increasing steadily. The main reason is that the majority of Peruvian construction companies are not following safety procedures, because once again, construction company owners perceive that safety slows down production.

In summary, the construction industry worldwide reflects a common problem, the disregard of safety on the job site and lack of proper safety training for construction laborers. Some countries like the United States have severe penalties for construction companies that don't properly manage safety procedures; other nations need to work more effectively on safety management.

## 2.6 Hispanic Construction Workers in the United States

Hispanic workers are facing a lot of issues in the workplace, a few of these are, language barriers, poor education, cultural barriers and more. Hispanic workers not only deal with the intrinsic difficulties of a specific job, but also the cumbersome situation of a different language and culture, factors making any job more difficult than it already is (Acosta et al. 2006).

In order to adequately discuss the safety of Hispanic workers in construction it is necessary to understand the immigration system in the U.S., including both legal immigrants and illegal immigrants who later receive amnesty and legal residency. The United States accepts approximately 900,000 legal immigrants each year; most of them are Hispanic (Brunette 2004). With regards to Hispanic workers, the construction industry in the United States has a larger share of Hispanic or Latino laborers (30 percent of all on-site construction workers), than any other industry except agriculture (36 percent) (Dong and Platner 2003; CPWR 2009).

During the past 15 years, the Hispanic work force in construction has been continuously growing (Dong and Platner 2003; Goodrum 2004; Perlich 2006; Reese and Eidson 2006). In fact, during the last 10 years, the number of Hispanics working in the construction trades in the United States has more than doubled (Brunette 2004). This incremental change has been so dramatic that in less than 20 years, from 1990 to 2008, the overall percentage of Hispanic construction employees in the United States almost tripled. In 2008 Hispanics represented 24.7 percent of all construction employees in the United States; whereas, in 1990 Hispanics only represented 9 percent of the construction work force in the United States. That means that today one out of every four construction workers in the United States is Hispanic or Latino (Lavy, Aggarwal and Porwal 2010). Based on these figures it is clear that the U.S. construction labor force has a strong Hispanic influence.

The U.S. Bureau of Labor Statistics stated that the Hispanic labor force increased 36 percent faster than that of other ethnic groups between 1996 and 2006 because of high immigration (Anderson, Hunting, and Welch 2000). This is especially interesting because among these Hispanic immigrant workers at least 62 percent reported that they did not speak English well or did not speak English at all (Lavy, Aggarwal and Porwal 2010).

Hispanic workers not only deal with the difficulties of construction work but also with the challenges of a different language, both factors that can make any job more difficult than it already is (Acosta et al. 2006; Lavy, Aggarwal and Porwal 2010). Many research studies suggest that the high rate of construction accidents in the Hispanic population is a result of language barriers (Acosta et al. 2006; Brunette 2004; Dong and Platner 2003; Goodrum and Jiukun 2005; Menzel and Gutierrez 2010; O'Connor et al. 2005; Lavy, Aggarwal and Porwal 2010).

The language barrier is not the only problem that the Hispanic construction workers face; the cultural barrier has also been described as another major challenge. Hispanic cultures regard work as essential to life and believe that pain is an inevitable part of work; thus, injuries and illnesses are expected to be common occurrences (Acosta et al. 2006). Other authors suggest that cultural issues, such as the need to find work and make money, the inability to understand safety policies and procedures, and the fear of retribution are some common factors that contribute to a high proportion of injuries among Hispanic construction workers (Lavy, Aggarwal and Porwal 2010). Another cultural issue that impacts the rate of injuries among Hispanics is the Latino image of “machismo.” This often plays a role in injury rates among Hispanics because it discourages workers from working safely and wearing proper safety equipment (Menzel and Gutierrez 2010). A large percentage of the Hispanic construction labor force consists of undocumented workers. In addition to the idea of “machismo”, undocumented workers often

have a fear of getting fired, so they take unnecessary risks in order to remain employed (Menzel and Gutierrez 2010).

The nature of taking risks in the construction industry is a reality for all workers, regardless of ethnicity; however, some studies have found that Hispanic construction workers experience especially high morbidity and mortality rates (Anderson , Hunting, and Welch 2000). The problem is that Hispanic workers are often at a disadvantage in relation to their non-Hispanic counterparts. As explained above, language barriers, poor work skills, cultural barriers, and legal status are some of the causes of the high rate of reportable accidents.

## **2.7 Fall Hazard Control Observed on Residential Construction Sites**

In order to remain economically competitive and in order to earn maximum profits, many residential contractors only execute basic safety measures and eliminate many important hazard prevention training programs during construction project implementation (Ching-Wu et al. 2010). As a consequence, workers with less experience, those employed by small-size contracting companies, and those who perform residential construction are more likely to experience fall injuries (Chi, Chang and Ting 2005).

Safety management is one of the main problems in the residential construction industry, especially among Hispanic workers. Many construction firms, especially small companies are simply not making the investment of time and money needed to provide adequate training to immigrant workers. Another issue is the tendency of young Hispanic immigrants to seek work from Latino contractors who do little safety training. Some studies indicate that single-family and residential buildings are frequently constructed by small-volume contractors who often provide relatively informal or inadequate safety training and inadequate PPE (Williams et al. 2010; Xinyu and Hinze 2003).

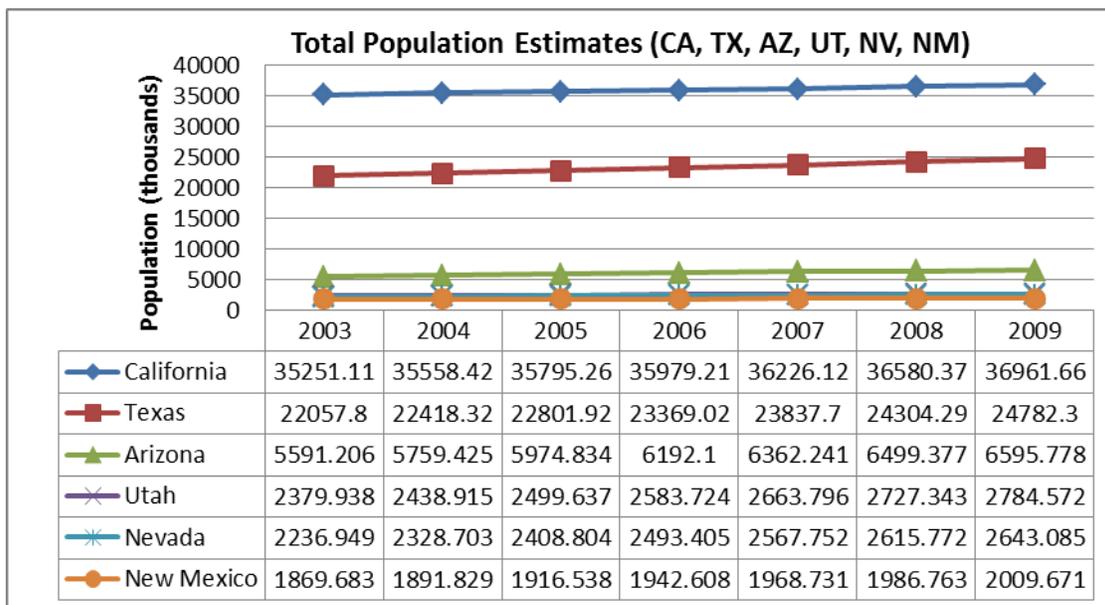
Fall accidents accounted for the largest percentage of reported construction-related accidents (Benjaoran and Bhokha 2010; Choi and Fredericks 2008). Multiple factors such as age, gender, visual performance, muscle strength, general health, medical condition, use of alcohol, drugs and medications, may affect the control of balance and increase the number of falls. However the most frequent contributor to fatal work-related falls is lack of fall protection in place (Hsiao and Simeonov 2001; Janicak 1998; Kines 2002). It was noted that falls commonly occur on projects that can be characterized as small and relatively low in cost and that involve new construction of commercial buildings and residential projects (Xinyu and Hinze 2003). If small contractors do not take safety training seriously, avoiding fall accidents will be difficult.

## **2.8 Review of Hispanic Construction Accidents in the State of Utah**

The Annual Bureau of Labor Statistics report on workplace fatalities in 2001 found that “The rate of on the-job deaths for all Hispanics has been 20 percent higher than for whites or blacks” (Brown, Domenzain and Villoria-Siegert 2010). There are several states that have high proportions of Hispanics or Latinos in their population. California, Texas, Florida and New York are good examples. These four states also contain a significant percentage of the overall U.S. population.

Major concentrations of Hispanics are also found in other Southwestern states bordering Mexico and in a number of additional Atlantic coast states, like Carolinas and Virginia. The Southwestern states tend to attract Hispanic immigrants from Mexico, and the Atlantic states attract a great number of Cubans and other Hispanics from the Caribbean. On the other hand, most states located along the Canadian border in the north or in the Northeast do not have such high concentrations of Hispanics.

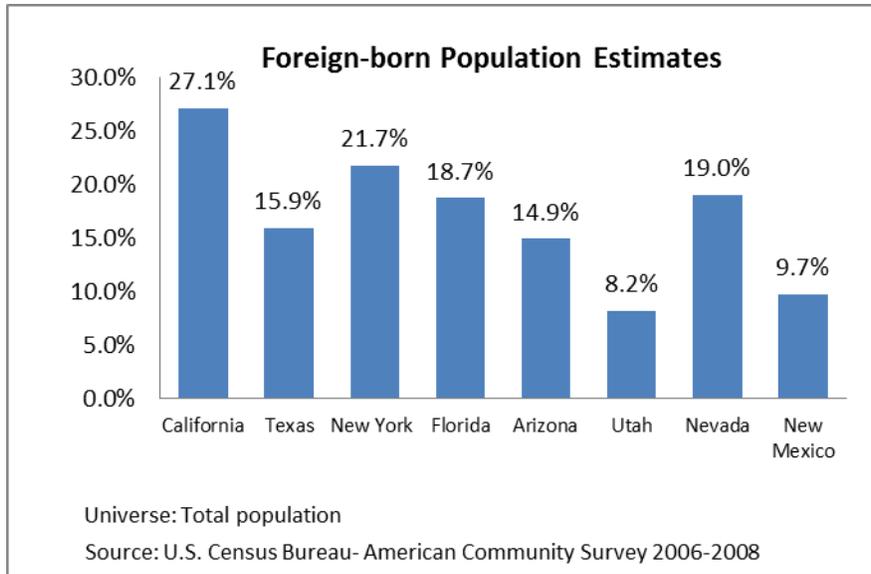
Because this research project focuses on Hispanic workers in Utah, it is interesting to make some demographic comparisons between Utah and some of the Southwestern states (California, Texas, Arizona, Nevada and New Mexico) that have high proportions of Hispanics. The first comparison has to do with the total population of each state. By 2009, California, the largest of the Southwestern states mentioned above, had a total population of 36,961,664 while Utah's total population at the same time was 2,784,572. Total population figures from 2003 to 2009 for all six Southwestern states are shown in Figure 2-2 below. Note that California has more than 13 times the population of Utah; Texas has almost 9 times the population, and so on.



**Figure 2-2: Total Population Estimates for CA, TX, AZ, UT, NV, NM**

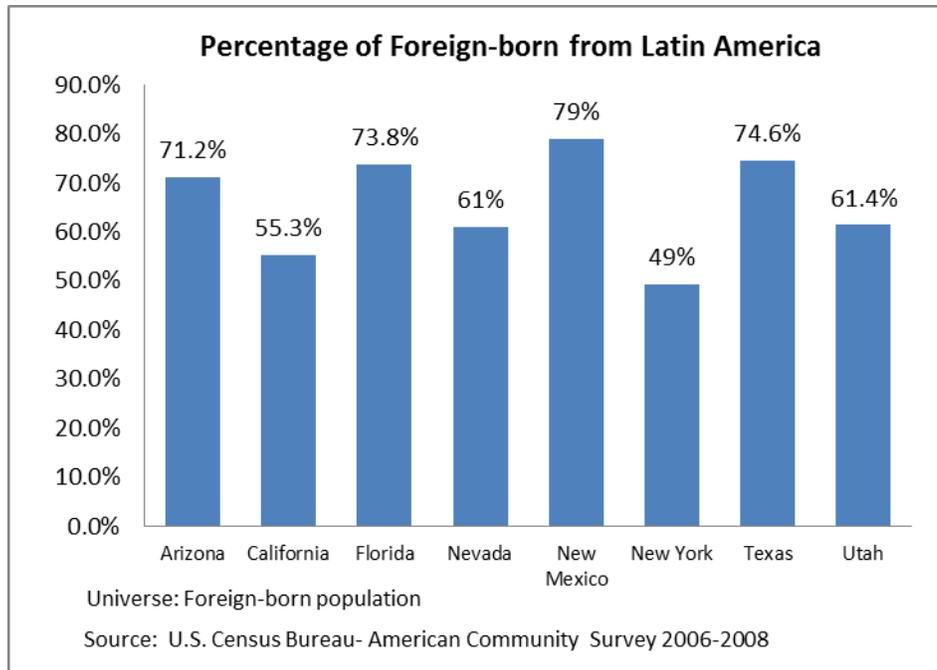
Next, a comparison of *foreign-born* persons in the six states listed above, plus Florida and New York, two states on the East Coast of the United States that also have high proportions of Hispanics among the states' populations, is shown in Figure 2-3 below. Note that more than 20 percent of two of these states' populations (California and New York) are foreign-born. In three

of the states (Nevada, Florida and Texas), foreign-born individuals represent between 15 and 20 percent of the total state populations. In the other three states (Arizona, New Mexico and Utah), fewer than 15 percent of the total populations are foreign born. Utah has the least percentage of foreign-born individuals, with 8.2 percent of the state’s population being foreign born.



**Figure 2-3: Percentage of Foreign-Born Populations**

The third comparison for foreign-born individuals shows how many of those who were born in other countries were born in Latin America (see Figure 2-4).



**Figure 2-4: Percentage of Foreign-born from Latin America**

Based on an extensive review of literature, very little quantitative information was discovered that described exact numbers of Hispanic versus non-Hispanic worker injuries on construction job sites. One thing, however, stands out regarding injuries to workers of all occupations. According to the U.S. Bureau of Labor Statistics, in the year 2009 the rate of nonfatal occupational injuries in Utah (4.2 per 100 workers) was higher than California (3.7 per 100), Arizona (3.5 per 100), and Texas (2.9 per 100). Nevada (4.3 per 100) and New Mexico (4.2 per 100) experienced almost the same exact rate of nonfatal injuries as Utah (see Figure 2-5).

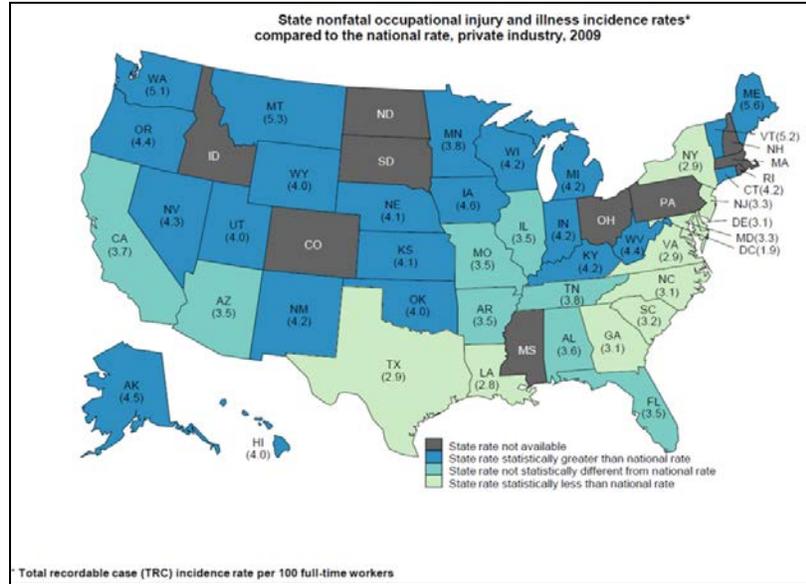


Figure 2-5: Non-fatal Occupational Injury Rates in the U.S.

Lack of reliable, published statistical data makes it difficult or impossible to compare precise accident rates between Hispanic and non-Hispanic construction workers. However, based on the review of literature, it is evident that immigration issues, language barriers, poor technical skills, and lack of or neglect for safety management procedures on construction sites have a profound impact on overall safety among Hispanic construction workers. Some authors suggest, however, that these challenges have resulted in a higher percentage of injuries and even fatalities among Hispanic construction workers than among non-Hispanic construction workers.



### **3 RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter will discuss the methodology used to determine why Hispanic on-site construction workers experience a higher proportion of reportable accidents than non-Hispanic on-site construction workers along the Wasatch Front in Utah. For the most part, qualitative methods of inquiry were used in the study and will be described in this chapter. Some descriptive statistical methods were also applied to help identify general characteristics of the sample. In addition, the methods employed to create the surveys used to gather data are also explained.

#### **3.2 Qualitative Research**

This section serves to justify the qualitative research methods used for this study. An overview of the methods is given, followed by an explanation of the data-gathering processes used in this research. Finally, an explanation is given of how the qualitative methods were applied to this thesis.

### **3.2.1 Overview**

Qualitative research is an evolving methodology that is used to gain new insights into phenomena. Its application has been mainly found in the social sciences, but it is gaining more momentum in other areas, such as organizational science and management (Merriam 2002). Marshal and Rossman (1995) suggest that qualitative research is designed to (a) understand processes, (b) describe poorly understood phenomena, (c) understand differences between stated and implemented policies or theories, and (d) discover thus far unspecified contextual variables. Qualitative research seeks to answer questions about the complex nature of phenomena as observed through the experience(s) of the researcher (Leedy, 2005). The results of a qualitative study usually end with questions or hypotheses about what was observed by the researcher.

### **3.2.2 Data Collection Methods**

There are three major methods that are used to collect data in qualitative research. These methods include: interviews, observations and documentation (Merriam 2002). The selection of which method to use depends on the nature of the data that is required by the researcher. If it is possible, researchers are encouraged to use more than one method for data collection, because the use of more than one method typically improves the validity of the findings (Merriam 2002). This combination of methodologies is called triangulation. By triangulating the methods, the findings of the study would be considered more accurate and valid

### 3.2.3 Application

In order to validate the information gained, this study utilized three techniques to collect information regarding “why Hispanic on-site construction workers experience a higher proportion of reportable accidents than non-Hispanic on-site construction workers along the Wasatch Front in Utah.”

First, interviews were conducted with general contractors, subcontractors (owners), safety managers or superintendents. The information obtained from these interviews gave the researcher insights into the owners’, on-site safety managers’ or superintendents’ perceptions regarding construction accidents among Hispanic workers along the Wasatch Front in Utah. The names of contractors and subcontractors to be interviewed were taken from the list of licensed contractors supplied by Utah’s Division of Occupational and Professional Licensing (DOPL). Initially the researcher attempted to make contact with research subjects by telephone; however, in almost every case, this proved to be unsuccessful. Some of the reasons it was difficult or impossible to collect data through phone calls are listed below:

- Almost all of the contractors and subcontractors refused to participate in the survey by telephone, stating that they were not interested or were "short of time".
- The majority of phone numbers published in the list of contractors received from DOPL were residential telephone numbers rather than business telephone numbers or personal cell phones, and the persons identified in the list were unavailable.
- Finally, the delicate situation of legal status for many Hispanic on-site workers made some of the contractors and subcontractors unwilling to participate in the study.

Because of these reasons, the author decided to make personal visits to job sites and talk

face-to-face with the people in charge of the job sites, who in the majority of the cases were, in fact, the contractors, safety managers and superintendents.

Second, personal interviews on the job site with Hispanic construction workers were conducted with permission of the contractors and owners. These interviews focused on the questions described later in this chapter that were developed to investigate construction accidents among Hispanic construction workers along the Wasatch Front.

Third, after interviews were conducted and data was gathered from contractors, job-site superintendents and Hispanic construction workers, the researcher visited three additional construction projects in order to simply observe Hispanic construction workers in their normal day-to-day activities while on the job. This final observational study gave the author a unique perspective to further analyze the nature of accidents among Hispanic construction workers. In addition to the on-site observations, during his first year living in the United States (2008-2009) the researcher himself worked in residential construction in the Salt Lake City area, giving an additional perspective regarding on-site construction activities from a Hispanic worker's point of view. In qualitative research, this type of observation is deemed to be that of active participant observation, which means that inquiries were made by the researcher when clarification of observed work activities and conditions were required.

### **3.3 The Survey**

#### **3.3.1 The Sample Group**

In this study, the population of interest consisted of on-site Hispanic construction workers along the Wasatch Front in Utah and the state-licensed general contractors, subcontractors, safety managers and superintendents for whom they worked. To access contact information for the companies described in this study, an approval letter from Brigham Young University's Institutional Review Board was submitted to the Utah Division of Occupational and Professional Licensing (DOPL). Once the approval letter was received by DOPL, a complete list of licensed general contractors and subcontractors located along the Wasatch Front was sent to the author. According to the literature review and as stated in Chapter 1 of this study, the top six trade classifications in which the rate of accidents among Hispanic construction workers appeared to be high included drywall, tile, concrete, painting, roofing and masonry (Brunette 2004). Table 3-1 below lists the six trades and the percentage of Hispanic construction workers that participated in each of the trades. Note that a single worker could be involved in more than one trade.

**Table 3-1: Hispanic Construction Workers as a Percentage of Selected Occupations**

<b>Percentage of Hispanic construction workers performing specific tasks within the industry. Note that some workers responded that they engaged in more than one task.</b>	<b>%</b>
Drywall installer	33
Tiler	31
Concrete worker	27
Painter	26
Roofer	23
Bricklayer, mason	18

The researcher's initial objective was to locate job sites along The Wasatch Front where Hispanic workers could be found working in these specific trades. For each of the six trade classifications the objective was to find at least ten Hispanic workers to participate in this study.

### **3.4 Utah's Wasatch Front**

For purposes of this study, the geographic area known as Utah's Wasatch Front is comprised of five counties that lie directly west of one of the major mountain ranges in Utah (the Wasatch Mountains). From north to south these counties are: Box Elder, Weber, Davis, Salt Lake and Utah. According to the U.S. Census Bureau, these five counties are home to more than three-fourths of Utah's total population. Based on estimates from the Census Bureau, 12 of the 19 most populous cities in Utah are located along the Wasatch Front.

In order to have a diversified survey, the researcher's objective was to visit at least two construction sites in eight of the major geographical areas located in the five counties that make

up Utah’s Wasatch Front. Table 3-2 below details these selected areas along with the five counties.

**Table 3-2: Distribution of Job Sites Along the Wasatch Front in Utah**

County	City	Job sites
Box Elder	Brigham City	2
Weber	Ogden	3
Davis	Farmington	1
	Bountiful	1
Salt Lake	Salt lake City	5
	Sandy	1
Utah	Orem	3
	Provo	2

With permission of contractors and site superintendents, Hispanic on-site construction workers were randomly selected from each of the 18 construction sites visited as a part of this study. A total of 47 construction workers consented to interviews.

### **3.5 Research Design**

In order to discover why there are a higher proportion of reportable accidents among Hispanic on-site construction workers than among non-Hispanic on-site construction workers along the Wasatch Front, a questionnaire, which will be discussed later in this chapter, was developed. Once the survey had been administered and all information had been collected, descriptive statistical methods were used in order to analyze some of the data gathered. Analysis of the data can be found in Chapter 4. This research was conducted according to Brigham Young

University's legal procedures and protocols. Permission to conduct this research using human subjects was obtained from Brigham Young University's Institutional Review Board.

### **3.6 Development of the Survey Instruments**

The survey instruments used in this study were developed following a thorough review of the literature, discussions with industry professionals, and input from professors of Construction Management at the university level. It should be interesting to note that one of the main reasons this research was conducted is because the author (originally from Peru) worked in the construction industry as an on-site laborer and observed or was involved in several construction accidents during his first year on the job along the Wasatch Front.

To develop an effective survey, survey questions and the length of time required for responses were carefully considered. If a survey is too long, respondents are less likely to participate.

Although all of the on-site laborers and all of the on-site superintendents were interviewed at the job sites, a few of the contractors were contacted and interviewed via telephone and email. An important factor to consider in the gathering of data for this study is that the researcher's origin (Peru) and physical characteristics (stature, skin and hair color) were similar to many of the Hispanic workers surveyed. It is the researcher's opinion that if a non-Hispanic researcher would have conducted the interviews, many of the Hispanic workers who responded to the questions would have refused to participate. Some of the reasons a non-Hispanic might have been unsuccessful in gathering data include the following:

- A surprisingly high percentage of the Hispanic workers interviewed gave indications that they were in the United States illegally. As a consequence, these Hispanics workers

would have been hesitant to share information with “gringos” that might be perceived as government representatives.

- Before the researcher asked for any information pertaining to this study, he would spend several minutes to create a friendly environment; for example, discussions about soccer, cultural issues, countries of origin, etc. were common themes. Upon establishing a measure of trust, Hispanic workers seemed to be more willing to answer questions about their work.

### **3.7 Composition of the Questionnaire**

Two main questions comprise the foundation of this research, and each person interviewed, including contractors, subcontractors, site superintendents and on-site laborer, was asked to respond to each of these two questions.

Question 1: In order of importance (most important to least important), what do you think are the three things that contribute most to job-site accidents among Hispanic construction workers? Translated into Spanish, the question is: *En orden de importancia (más importante a menos importante) ¿cuáles cree usted que son las tres cosas que contribuyen más para que ocurran accidentes de construcción en los trabajadores Hispanos?*

This question is vitally important to the research because of the possible answers. First of all, answers will explain points of view regarding construction accidents among Hispanic on-site construction workers. In addition, Hispanic on-site construction workers will be asked to answer the same question, and it will be important to understand their perceptions of safety on the job site.

Question 2: In order of importance (most important to least important), what three steps should be taken to reduce or eliminate job-site accidents among Hispanic workers? Translated into Spanish, the question is: *En orden de importancia (más importante a menos importante) ¿cuáles son los tres pasos que se deben dar para reducir o eliminar los accidentes de construcción en los trabajadores Hispanos?*

Answers to this question should help determine what Hispanic construction workers think about safety measures that they can use to reduce job-site dangers. Also, perceptions of contractors, subcontractors and site superintendents regarding implementation of safety procedures can be compared to those expressed by the workers.

In addition to the two main research questions, demographic information for on-site construction workers will be obtained through the following questions. Note that Spanish translations for each question are included below.

- Where were you born? *¿En que país nació usted?*
- How old are you? *¿Cuántos años tiene?*
- What is the highest level of formal education you have? Possible answers include: elementary school, junior high school, high school, or university. *¿Qué nivel de educación formal tiene? (primaria, secundaria, superior)*
- How fluent are you with the English language? Possible answers include: I don't understand English, I understand and speak a little English, I understand and speak passable English, I understand and speak English very well. *¿Que tanto usted domina inglés? (No entiendo inglés, entiendo y hablo un poquito de inglés, entiendo y hablo moderadamente inglés, entiendo y hablo Inglés muy bien)*

Answers to this question might prove to be important in determining if lack of English language skills contribute to the number of reportable construction accidents among Hispanic on-site workers.

- How long have you been working in the construction Industry? Possible responses include: less than one year, one to five years, six to ten years, eleven to fifteen years, more than fifteen years. *¿Cuánto tiempo usted ha estado trabajando en la industria de la construcción?(menos de un año, entre uno y cinco años, entre seis y diez años, entre once y quince años, más de quince años)*

This information might prove to be important in determining if lack experience on the job is a contributing factor in the number of reportable construction accidents among Hispanic on-site workers.

- How long have you been working in construction in the United States? *¿Cuánto tiempo usted está trabajando en la construcción dentro de los Estados Unidos de América?*

Based on the researcher's personal experience and according to the literature review, Hispanic construction workers face many difficulties while adapting to new norms and requirements in the construction Industry in the United States (Tariq and Everett, 2000). As a consequence, the preceding question might disclose significant information on whether the length of time working in the United States has a significant influence on accident rates among Hispanic workers.

- In what trades in the construction industry have you had significant experience? *¿En qué ocupaciones de la construcción usted tiene mayor experiencia?*

The purpose of this question is to determine whether previous work experience in specific trades has an effect on reportable accidents. Based on the literature review and the author's

personal experience in the residential construction labor force along The Wasatch Front, Hispanic construction workers are often willing to do any kind of construction labor. In other words, Hispanic construction workers do not always specialize in one trade, but many tend to have a basic to moderate knowledge of various construction-related tasks. This might be another reason that construction accidents are more prevalent among Hispanic workers.

A copy of the actual questionnaire used by the researcher to gather data from on-site laborers can be found in Appendix A.

### **3.8 Analysis of the Data**

The purpose of this study is to gather data from participants in the sample regarding the things considered to contribute most to job-site accidents among Hispanic construction workers. Because responses to Questions 1 and 2 above will be given in priority order, listed one through three, a scoring system has been devised to compile the results. Each respondent's first answer will be assigned three points; the second answer in priority order will be assigned two points; and the third answer in priority order will be assigned one point.

In order to categorize and score the responses, a grid will be developed. All of the unique responses will be identified along one axis of the grid. The other axis will contain a list of the valid questionnaires. All responses will be entered into a spreadsheet, and individual scores will be recorded for each response. Then the scores will be totaled and ranked from the highest to lowest. After listing the responses in rank order, similar responses will be categorized.

### 3.9 Contractor/Subcontractor Questionnaire

The following paragraphs include wording for a cover letter that accompanied written questionnaires given to a few contractors, subcontractors and site superintendents along with the specific questions designed for these respondents. In most cases, however, the researcher conducted face-to-face surveys with contractors, subcontractors and site superintendents.

The cover letter reads as follows: This survey is for a master's thesis research project in Construction Management at Brigham Young University. The data collected from the survey focuses on the rate of accidents that Hispanic construction workers face in the workplace. The survey is designed take approximately ten minutes.

Participation is voluntary. Your personal information will be kept confidential. If you have any questions concerning this survey or research, please contact Brigham Young University's Institutional Review Board, A-285 ASB Provo Utah 84602 (801) 442-3841/Fax: (801) 422-0620.

After the respondents received the cover letter, they were asked to answer the following questions.

- How many years have you been in the construction industry? Possible responses include: Less than one year, one to five years, six to ten years, eleven to fifteen years, more than fifteen years.
- (If a trade contractor or subcontractor) How many years in the trade? Possible responses include: Less than one year, one to five years, six to ten years, eleven to fifteen years, more than fifteen years.

- In order of importance (most important to least important), what are the three things that contribute most to job-site accidents among Hispanic construction workers?
- In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?
- What percentage of your total on-site workers is Hispanic?

A copy of the complete written questionnaire for contractors, subcontractors and site superintendents can be found in Appendix B.

## 4 RESULTS

### 4.1 Introduction

The survey instruments for this study were designed to collect information regarding safety concerns among Hispanic workers along the Wasatch Front in Utah. One survey instrument was directed toward contractors, subcontractors and site superintendents, while another similar survey instrument was created for on-site workers. Both surveys included two main questions discussed in Chapter 3, with some additional demographic questions that will be analyzed later in the chapter.

The first two questions and the last question in the contractor/subcontractor questionnaire were intended to gather basic demographic information regarding: 1) how many years the contractor, subcontractor, site superintendent or the safety manager has been working in the construction industry; 2) if a trade contractor or subcontractor, how many years in the trade; and 3) what percentage of the total on-site employees of the company is Hispanic.

A number of questions on the worker questionnaire were intended to gather basic demographic information regarding Hispanic workers, including the following: 1) place of birth; 2) formal education levels; 3) English language fluency; 4) how long the workers have been working in construction; 5) how long Hispanic employees have been working in construction in the United States; and 6) the trades in which Hispanic workers are most experienced.

Soon after the survey was launched, it became apparent that results would not be as forthcoming as expected. Only a few people agreed to participate in the survey through phone calls during the first week. Some of the reasons phone calls did not work well include:

- The majority of phone numbers on the list of licensed contractors provided by the Utah Division of Occupational and Professional Licensing (DOPL) were residential telephone numbers rather than work telephone numbers or cell phone numbers, and the persons (contractors/subcontractors) identified were not at home.
- The refusal of potential respondents to answer the survey questions over the phone.
- Finally, the delicate situation of legal status for some Hispanic workers suggested unwillingness on the part of both employers and employees to participate in the study.

If contacting contractors, subcontractors, site superintendents or safety managers by phone was difficult, to interview Hispanic construction workers by telephone was virtually impossible, because their phone numbers were not even available. For these reasons, the researcher decided to visit selected job sites and speak face-to-face with contractors, owners, and safety managers. In fact, even when respondents indicated that they were busy, in all cases they found the necessary time to complete the survey when confronted face-to-face. Additionally, the researcher had great success in contacting the Hispanic construction workers during their lunch-time hours.

This research project was designed to collect information from respondents located along the Wasatch Front in Utah. The researcher began collecting data in north region of the study area, starting with job sites in Brigham City. Next, data was gathered on job sites in Ogden, Farmington, Northern Salt Lake City, downtown Salt Lake City, Sandy and Provo (the southernmost region of the study area).

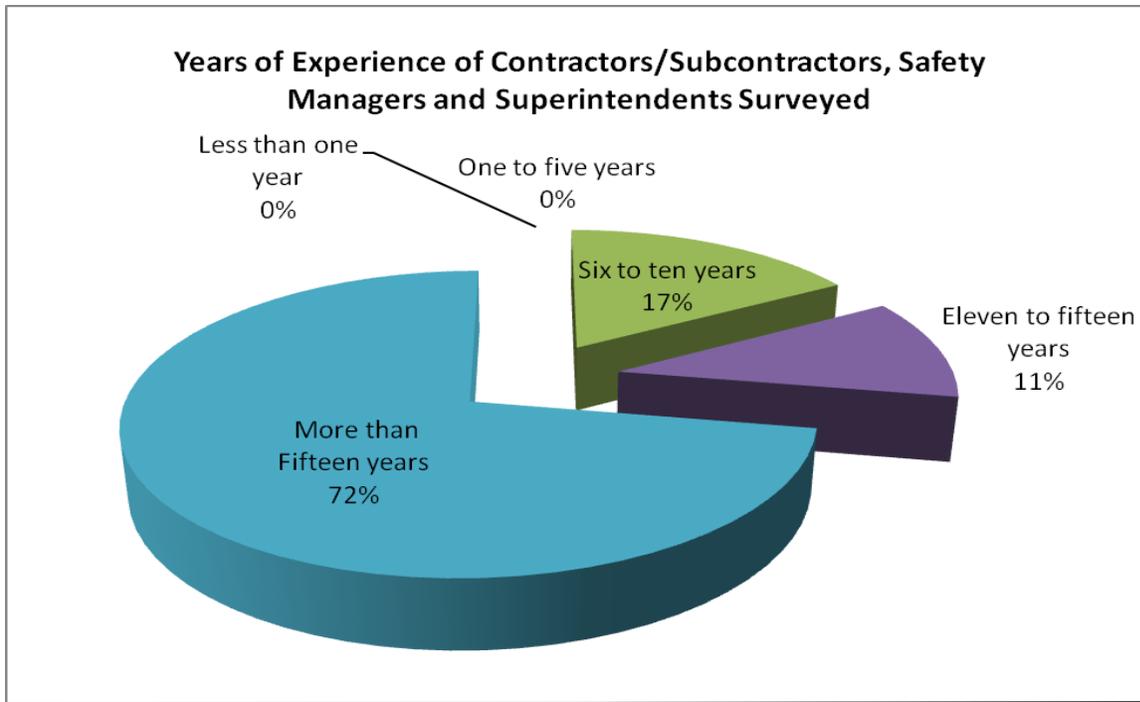
## 4.2 Description of Companies Surveyed

Eighteen companies were randomly chosen to participate in this study. Included in the sample were both residential and commercial contractors. Eleven were commercial general contractors, while seven were residential general contractors. Each of the companies was headquartered in cities along the Wasatch Front in Utah. In each company surveyed, Hispanic workers represented between twenty and eighty percent of the total work force. Companies varied in size from small residential builders to large commercial builders. In only a few cases did companies in the sample build projects outside of the Wasatch Front. Because all responses were anonymous, the names of companies responding to this survey will not be given.

### 4.2.1 Demographics

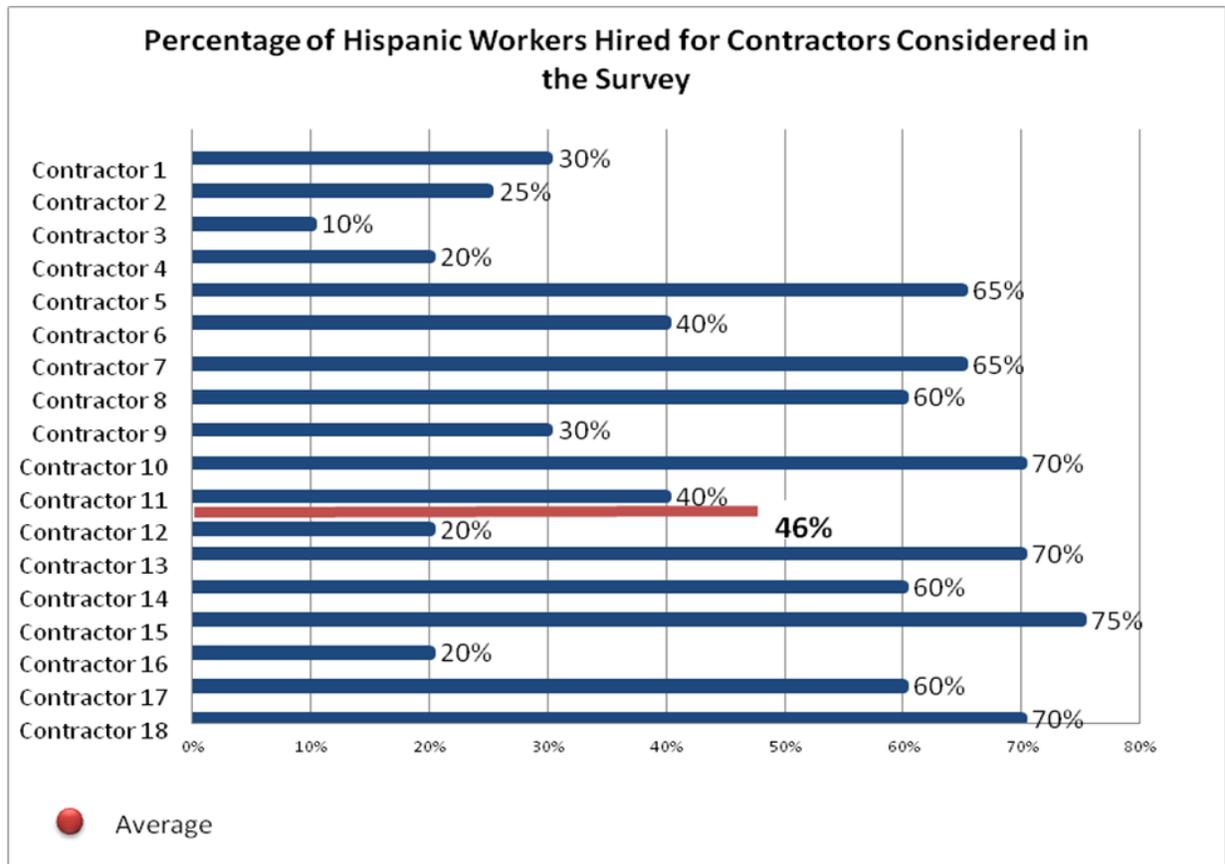
This section gives a brief description of the overall demographics of the companies surveyed and the Hispanic workers who responded to the survey.

***Contractor's/subcontractor's questionnaire:*** A total of 18 contractors, subcontractors, safety managers and site superintendents were surveyed. Of the 18 individuals surveyed, 7 were residential contractors, and the rest were safety managers or superintendents of commercial construction projects. In response to the question, "How many years have you been in the construction industry?" a high percentage of those surveyed indicated that they had more than 15 years of experience (72 percent); 11 percent said they had been working in construction industry for 10 to 15 years; while 17 percent had between 6 and 10 years of construction experience (see Figure 4-1).



**Figure 4-1: Years of Experience of Contractors, Subcontractors, Safety Managers and Superintendents**

It became apparent that in jobs requiring higher levels of training or education, there was a lower percentage of Hispanic workers than in jobs that required little training. In some cases, Hispanic workers represented 75 percent of the total job-site employees interviewed, while in others Hispanic construction workers represented only 10 percent of the job-site workforce. However, the average percentage of Hispanic construction workers represented 46 percent of a company's labor force (see Figure 4-2).



**Figure 4-2: Percentage of Hispanic Workers at the Job-sites**

It should be noted that according to information given by general contractors, subcontractors, safety managers and superintendents a high percentage of Hispanic construction workers were on the job sites at the beginning of the project. This is because a high percentage of Hispanics work in tasks that do not require high skill levels, such as demolition, concrete, framing, roofing and drywall, tasks that are done earlier in the construction process. However, it was common to have lower percentages of Hispanic construction workers on site toward the end of the projects when specialized work that required skilled labor, like electrical, plumbing, and finish work, was being done. During visits to job sites, the researcher observed that this was generally true; more Hispanics worked at the beginning of a project than at the end of a project.

Of the 18 contractors that were surveyed, some of them required more skilled labor and therefore had a lower percentage of Hispanics on the payroll.

### 4.3 Hispanic Workers Questionnaire

It was truly challenging collecting the data from Hispanic workers, likely attributable to the sensitivity of the legal status of the majority of the Hispanic workers contacted. At the beginning of survey process, almost all of the Hispanic interviewees were afraid to share information with the researcher. In fact, many Hispanic construction workers refused to participate in the survey, while others agreed to participate but with the condition of maintaining anonymity with their personal information. In relation to the question, “where were you born”, a great percentage of the surveyed workers (83 percent) were from Mexico. Seven and six percent, respectively, were from El Salvador and Guatemala. Only a few of the workers surveyed (four percent) were from Argentina or Peru (see Figure 4-3).

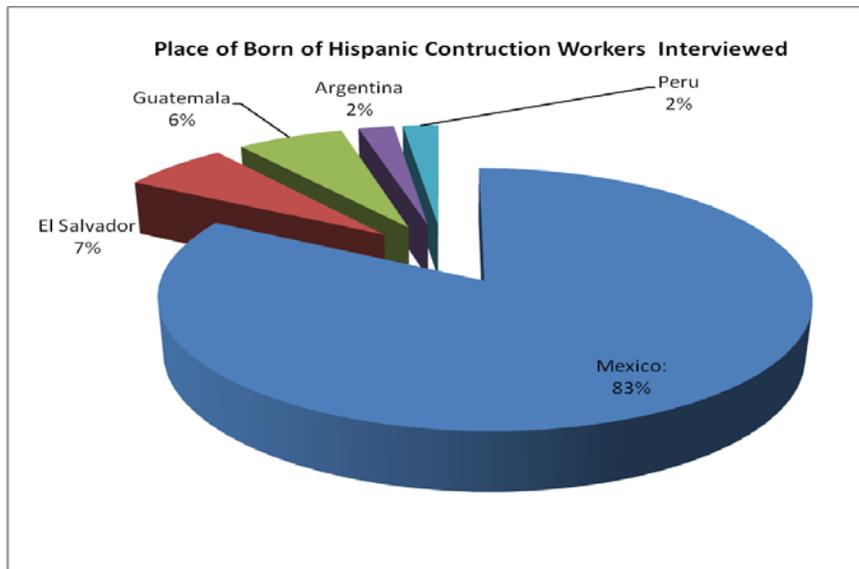
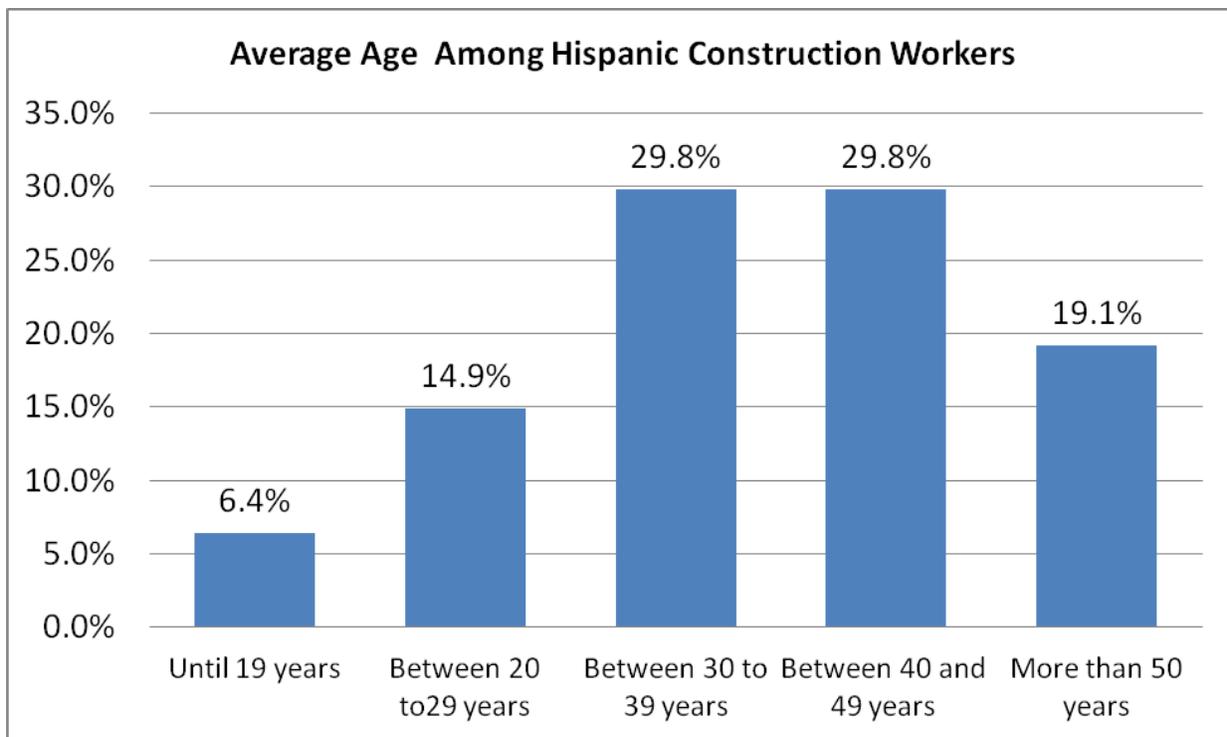


Figure 4-3: Place of Birth - Hispanic Workers

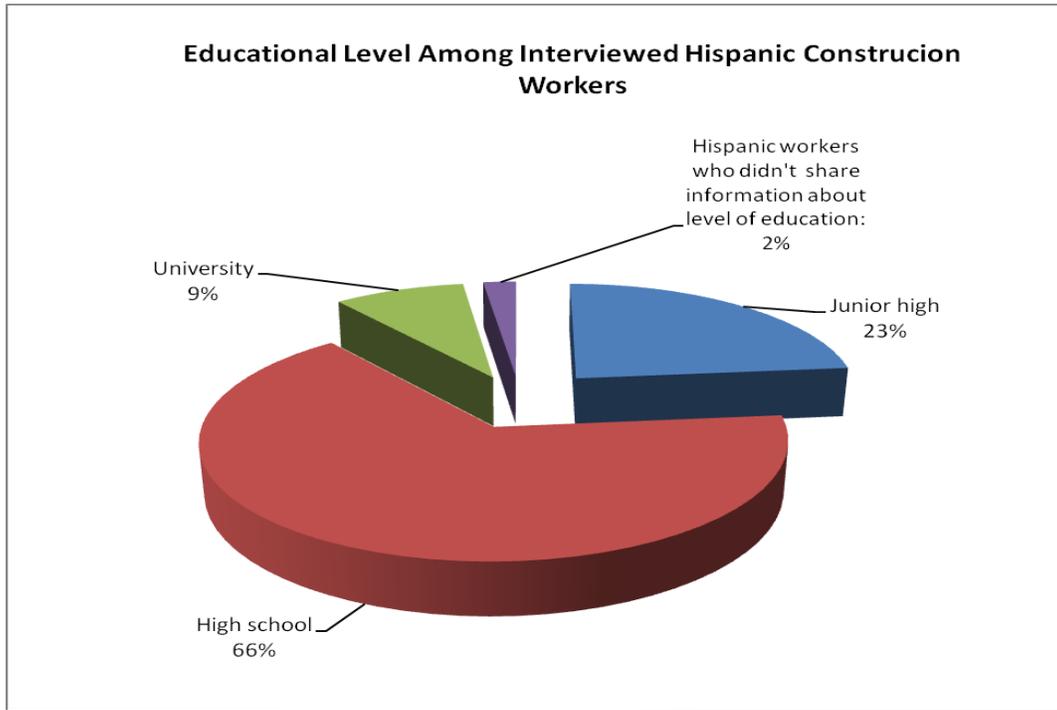
Almost 30 percent (29.8 percent) of Hispanic workers were between 40 and 49 years of age; the same number (29.8 percent) were between 30 and 39 years of age; workers more than 50 years of age represented 19.1 percent of those surveyed; 14.9 percent were between 20 and 29 years of age; and only 6.4 percent of the Hispanic workers surveyed were young than 20 years. In other words, the majority (59.6 percent) of Hispanic workers surveyed was between 30 and 49 years of age (see Figure 4-4).



**Figure 4-4: Average Age among Interviewed Hispanic Workers**

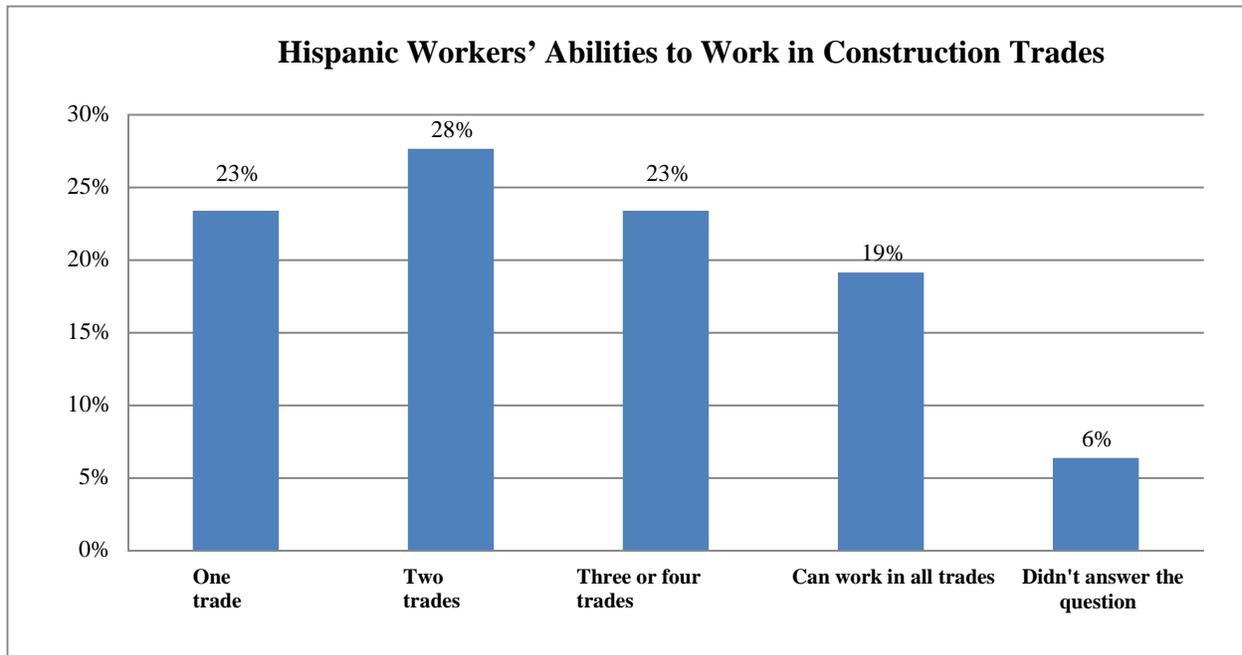
Of the Hispanic workers surveyed 66 percent indicated that they had completed high school, while 23 percent said they had only completed a junior-high school level of education. Nine percent of the Hispanic workers surveyed had studied at the university level, but none had earned a degree (see Figure 4-5). Two Hispanic workers who attended the university said, "We

came to work in the United States because we could earn more money here in the United States than we could working with a university degree in our home country."



**Figure 4-5: Formal Education Level of Hispanic Construction Workers Surveyed**

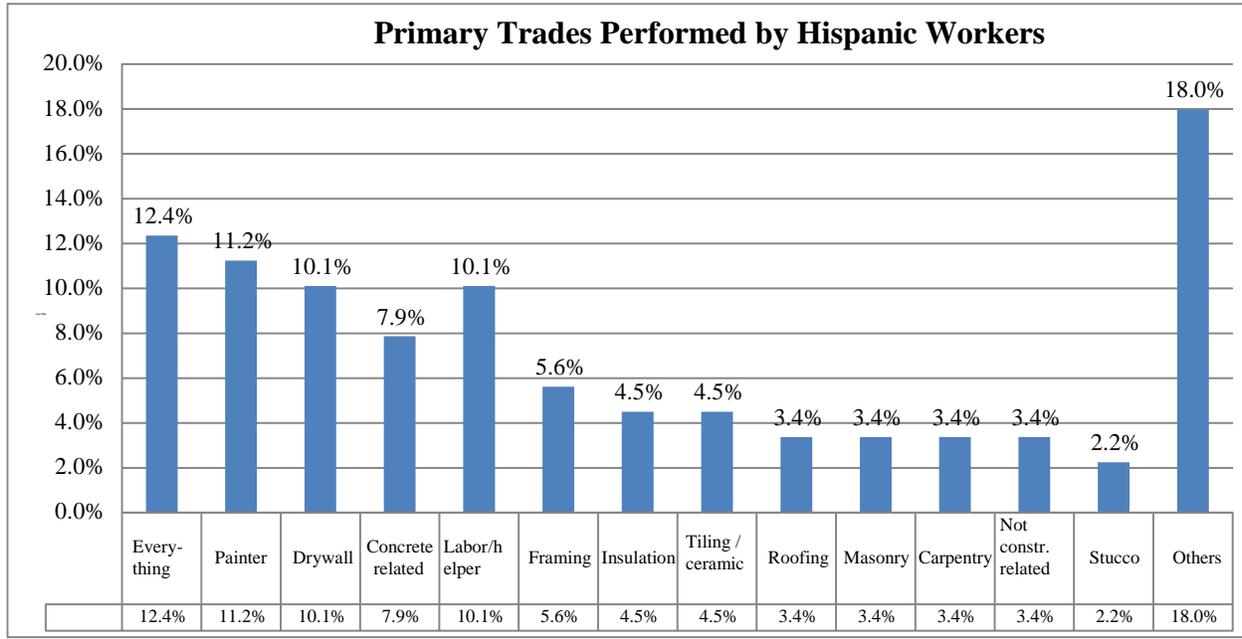
With respect to the on-site trades performed by the construction workers surveyed, 19 percent indicated that they were able to do anything on the construction site; 23 percent said that they they were proficient in three or four different trades; 28 percent said that they were able to work in at least two trades; and 23 percent of those surveyed stated that they were proficient in only one trade. Six percent of the surveyed workers did not give information regarding their ability to complete tasks in given trades (see Figure 4-6).



**Figure 4-6: Hispanic Workers' Abilities to Perform Different Trades**

According to the data gathered, it was determined that painting (11.2 percent) was the primary trade most identified by Hispanic workers, followed by drywall with 10.1 percent. Almost 8 percent (7.9) of the respondents indicated they worked in concrete-related tasks; 5.6 percent indicated framing as their primary trade; both tile and insulation were primary trades for 4.5 percent of the respondents, respectively. It is interesting to note that 10.1 percent of those surveyed responded that their primary work was that of a laborer or helper, which meant they could work in any job or occupation as long as they were being supervised and were working as a “helper or assistant”. About one out of eight (12.4 percent) indicated that they did "everything", which meant that the worker went from trade to trade as necessary. Roofing (3.4 percent), masonry (3.4 percent), finish carpentry (3.4 percent), and stucco (2.2 percent) were each primary trades for a small percentage of respondents. Eighteen percent of those surveyed did not have a specific trade preference. Three of the surveyed workers said that they were working in

construction temporarily, and their real occupations were mechanic, baker and chef, respectively (see Figure 4-7).



**Figure 4-7: Primary Trades Performed by Hispanic Construction Workers**

The last part of the demographic section dealing with Hispanic construction workers has to do with their ability to understand and to write English. Fifteen of the Hispanic workers surveyed responded that they understood and wrote English very well; however, three of the workers who claimed to understand and to write English well filled out the survey in English with several major grammatical errors. Thirteen percent said that they understood and wrote passable English. Two of the workers – coincidentally the youngest of the group at 18 years of age – indicated that the majority of Latinos believe that they understand English well, when the truth is that they are still learning. Fifty-one percent of the total workers said that they understood and wrote English just a little bit. Twenty-one percent confessed that they didn't understand English at all (see Figure 4-8).

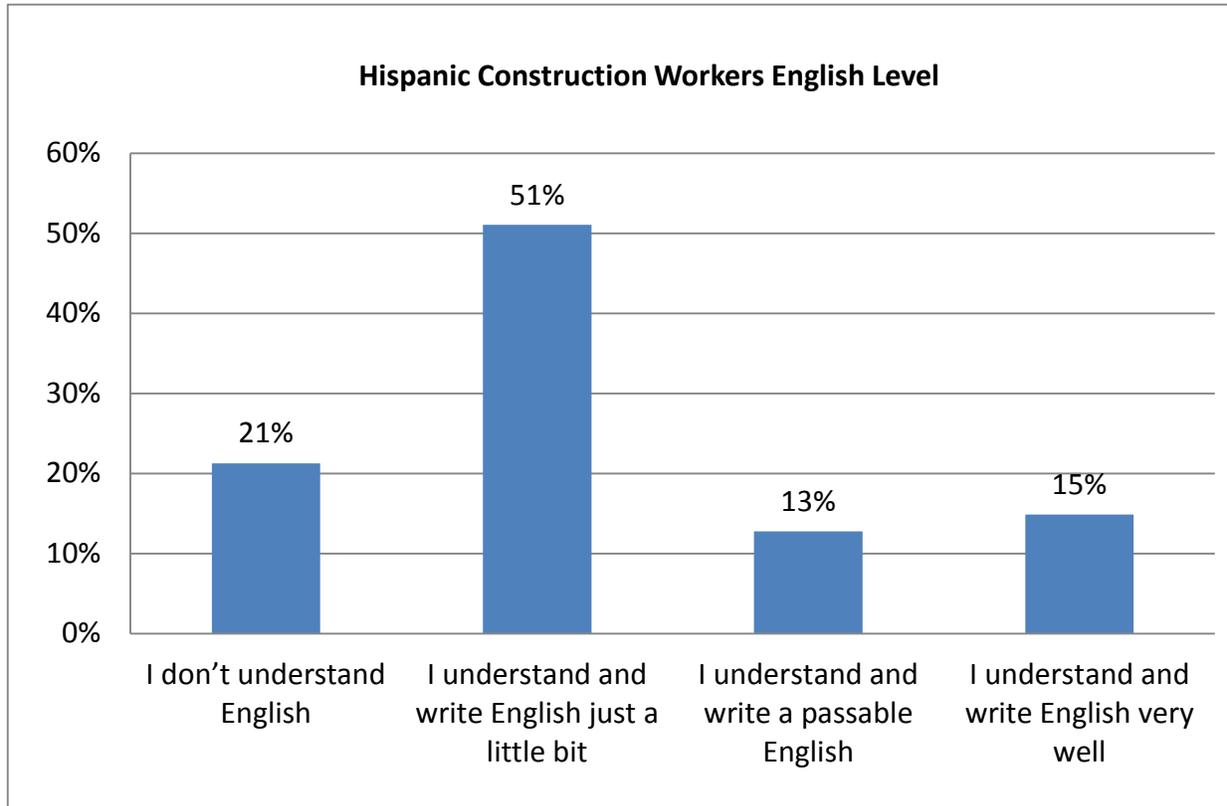


Figure 4-8: English Skills of Hispanic Construction Workers

#### 4.4 Factors Leading to Construction Accidents among Hispanic Workers Perceptions

All participants in this study were asked to list in priority order the three most important things that contributed to accidents among Hispanic construction workers. Rather than compiling a predetermined list of possible causes of construction accidents from which respondents could choose, those participating in this study were asked to determine their own answers. The two main questions in this study were:

1) In order of importance (most important to least important), what are the three things that contribute most to job-site accidents among Hispanic construction workers?

2) In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?

For purposes of this study, these two questions were designed to identify what perceptions contractors/subcontractors, safety managers or superintendents and Hispanic construction workers in residential and commercial construction companies held regarding reasons contributing the rate of accidents among Hispanic construction workers.

The researcher had a goal to survey at least 18 contractors, subcontractors, safety managers or superintendents. In addition, 47 Hispanic construction workers were interviewed. Only four of those who participated in the survey gave fewer than three responses to each of the two main research questions. On the other hand, five of the respondents of the respondents actually gave more than three responses to at least one of the two main research questions.

Because the answers were given in priority order, listed one through three, a weighted scoring system was used to compile the results. For purposes of this study, the first answer given was assigned three points, the second was assigned two points and the third question was assigned a single point. In the case of those who gave fewer than three answers, the same point system was followed for the responses given; the first answer was assigned three points, and if there was a second answer, that was given two points. Additionally, when more than three responses were received from one person, each additional response -- after the first three responses -- was assigned a single point.

The author of this study, who worked for more than five years as an engineer that supervised construction projects in Peru, classified each written response and compiled these responses by category. A spreadsheet was then developed in order to sum the scores for each category.

With respect to answers given to the first main question by contractors/subcontractors, safety managers and superintendents, ten unique responses were identified. These ranged from the most frequent response, *Language barriers*, to the least frequent response, *Safety attitude is*

not a priority due to cultural background, were identified along one axis of the spreadsheet grid. The other axis contained a list of the eighteen questionnaires. All responses were entered into the spreadsheet, and individual scores for each of the ten responses were recorded. The scores were then totaled and ranked from highest to lowest. Results are shown below in Table 4-1.

**Table 4-1: Factors that Contribute to Job-site Accidents (Contractors'/Subcontractors', Safety Managers', Superintendents' Perceptions)**

<b>Contractors'/Subcontractors', Safety Managers', Superintendents' Perceptions of Factors Contributing to Job Site Accidents Among Hispanic Workers</b>			
<b>Individual Rank</b>	<b>Individual Category</b>	<b>Adjusted Points</b>	<b>Percentage</b>
1	Language barriers	31	31.6%
2	Lack of on-site training	22	22.4%
3	Worker negligence or carelessness	14	14.3%
4	Accidental falls	6	6.1%
5	Lack of construction experience	5	5.1%
6	Lack of or ignorance to safety guidelines on the job site	5	5.1%
7	Working in a hurry or doing things too fast	4	4.1%
9	Miscellaneous accidents	4	4.1%
8	Not using Personal Protective Equipment	4	4.1%
10	Safety Attitude is not a priority due to cultural background	3	3.1%

By categorizing the individual responses listed above, it is interesting to note that each response can be placed into one of the four main categories regarding safety issues discussed in the review of literature. These categories include *Negligence, Training and Experience, Cultural Issues* and *Communications*. Note in Table 4-2 below that contractors/subcontractors, safety managers and superintendents believed that language barriers represented the most important factor that contributed to job-site accidents among Hispanic workers. These same respondents

believed that, in order of priority, lack of training and experience, followed by cultural issues and finally worker negligence contributed to on-site accidents.

**Table 4-2: Combined and Categorized Responses of Factors that Contribute to Job-site Accidents (Contractors'/Subcontractors', Safety Managers', Superintendents' Perceptions)**

<b>Perceptions of Contractors, Subcontractors, Safety Managers and Superintendents Regarding Factors that Contribute to Job-site Accidents Among Hispanic Workers (Individual Responses Combined and Categorized -- In Order of Priority)</b>			
<b>Individual rank</b>	<b>Categories</b>	<b>Adjusted points</b>	<b>Percentage</b>
	<b>Language and Communication</b>		
1	Language barriers	31	31.6%
	Totals for category	31	31.6%
	<b>Training and Experience</b>		
2	Lack of on-site training	22	22.4%
5	Lack of construction experience	5	5.1%
	Totals for category	27	27.6%
	<b>Cultural Issues</b>		
3	Worker negligence or carelessness	14	14.3%
8	Not using Personal Protective Equipment	4	4.1%
10	Safety Attitude is not a priority due to cultural background	3	3.1%
	Totals for category	21	21.4%
	<b>Worker Negligence</b>		
4	Accidental falls	6	6.1%
6	Lack of or ignorance to safety guidelines on the job site	5	5.1%
7	Working in a hurry or doing things too fast	4	4.1%
9	Miscellaneous accidents	4	4.1%
	Totals for category	19	19.4%

A spreadsheet was then developed to identify and score the individual responses, given by the 47 Hispanic workers, to the question, *In order of importance (most important to least important), what are the three things that contribute most to job-site accidents among Hispanic construction workers?* Eighteen unique responses, ranging from the most frequent response,

Worker negligence or carelessness (*Negligencia del trabajador*) to the least frequent response, *Not properly reading instructions for each chemical before use (Inapropiada lectura de las instrucciones de cada quimico antes de su uso)* were identified along one axis of the grid. The other axis contained a list of the 47 valid questionnaires. All responses were entered into the spreadsheet, and individual scores for each of the unique responses given in the 47 questionnaires were recorded. The scores were then ranked from highest to lowest. Results are shown below in Table 4-3.

**Table 4-3: Factors that Contribute to Job-site Accidents (Perceptions of Hispanic Workers)**

<b>Perceptions of Hispanic Construction Workers About Factors that Contribute to Job-site Accidents Among Hispanic Workers</b>			
<b>Individual Rank</b>	<b>Individual Category</b>	<b>Adjusted Points</b>	<b>Percentage</b>
1	Worker negligence or carelessness	46	16.5%
2	Working in a hurry or doing things too fast	34	12.2%
3	Lack of or ignorance to safety guidelines on the job site	29	10.4%
4	Distractions	28	10.1%
5	Lack of communication/language barriers	24	8.6%
6	Going to work under the influence of alcohol or harmful drugs	17	6.1%
7	Not using Personal Protective Equipment	17	6.1%
8	Lack of construction experience	16	5.8%
9	Lack of on-site training	16	5.8%
10	Misuse of tools and equipment	16	5.8%
11	Going to work with outside pressures (stress, illness, etc.)	7	2.5%
12	Hispanics work in riskier jobs	6	2.2%
13	Lack of proper supervision and instruction	6	2.2%
14	Working without proper rest	5	1.8%
15	Overconfidence	4	1.4%
16	Accidental falls	3	1.1%
17	Not understanding how dangerous the job is	3	1.1%
18	Not properly reading instructions for each chemical before use	1	0.4%

By categorizing the individual responses listed above, it is interesting to note once again that they can all be placed into the four main safety categories discussed in the review of literature, including *Negligence, Training and Experience, Cultural Issues* and *Communications*. Note in Table 4-4 below that Hispanic construction workers believed overwhelmingly that worker negligence was the main factor that contributed to on-site accidents. On the other hand, contractors/subcontractors, safety managers and superintendents perceived worker negligence and carelessness as the least important factor contributing to job-site accidents. Hispanic workers did agree with contractors/subcontractors, safety managers and superintendents that lack of training and experience along with cultural issues were the second and third most important factors. However, Hispanic workers did not believe that language barriers contributed significantly to on-site accidents; whereas owners believed it was the most important cause of accidents. Results are shown below in Table 4-4.

**Table 4-4: Combined and Categorized Responses of Factors that Contribute to Job-site Accidents (Hispanic Workers' perceptions)**

<b>Perceptions of Hispanic Construction Workers Regarding Factors that Contribute to Job-site Accidents Among Hispanic Workers (Individual Responses Combined and Categorized -- In Order of Priority)</b>			
<b>Individual rank</b>	<b>Categories</b>	<b>Adjusted Points</b>	<b>Percentage</b>
	<b>Worker Negligence</b>		
1	Worker negligence or carelessness	46	16.5%
2	Working in a hurry or doing things too fast	34	12.2%
3	Lack of or ignorance to safety guidelines on the job site	29	10.4%
4	Distractions	28	10.1%
16	Accidental falls	3	1.1%
	Totals for category	140	<b>50.4%</b>
	<b>Training and Experience</b>		
8	Lack of construction experience	16	5.8%
9	Lack of on-site training	16	5.8%
10	Misuse of tools and equipment	16	5.8%
13	Lack of proper supervision and instruction	6	2.2%
17	Not understanding how dangerous the job is	3	1.1%
	Totals for category	57	<b>20.5%</b>
	<b>Cultural Issues</b>		
6	Going to work under the influence of alcohol or harmful drugs	17	6.1%
7	Not using Personal Protective Equipment	17	6.1%
11	Going to work with outside pressures (stress, illness, etc.)	7	2.5%
12	Hispanics work in riskier jobs	6	2.2%
14	Working without proper rest (parties)	5	1.8%
15	Overconfidence	4	1.4%
	Totals for category	56	<b>20.1%</b>
	<b>Language and Communication</b>		
5	Lack of communication/language barriers	24	8.6%
18	Not properly reading instructions for each chemical before use	1	0.4%
	Totals for category	25	<b>9.0%</b>

In relation to the second main question, *In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?* contractors/ subcontractors, safety managers and superintendents gave nine unique responses, ranging from the most frequent response, *Provide improved safety training*, to the least frequent response, *Company to provide training materials in Spanish*. These unique responses were identified along one axis of a grid. The other axis contained a list of the eighteen questionnaires. All responses were entered into a spreadsheet, and individual scores for each of the nine unique responses were recorded. Scores for each response were then totaled and ranked from highest to lowest. Results are shown below in Table 4-5 below.

**Table 4-5: Factors that Contribute to Reduce or Eliminate Job-site Accidents (Contractors'/Subcontractors' Safety Managers', Superintendents' Perceptions)**

<b>Contractors'/Subcontractors', Safety Managers', Superintendents' Perceptions of Factors Contributing to Eliminate or Reduce the Rate of Job-site Accidents Among Hispanic Workers</b>			
<b>Individual Rank</b>	<b>Individual Category</b>	<b>Adjusted Points</b>	<b>Percentage</b>
1	Company to provide improved safety training	39	41.1%
2	Workers to learn English in order to improve communications	28	29.5%
3	Workers to obey safety regulations and wear personal protective equipment	11	11.6%
4	Company to hire bilingual workers or have translators on site	10	10.5%
5	Workers to focus on the job at hand (avoid carelessness)	2	2.1%
6	Workers to analyze job hazards and don't take unnecessary risks	2	2.1%
7	Workers need more time in the United States to better understand how things are done	1	1.1%
8	Workers need to slow down -- stop rushing	1	1.1%
9	Company to provide training materials in Spanish	1	1.1%

It is evident from the responses that most of the contractors/subcontractors, safety managers, and superintendents believed that the most critical factor to reduce or eliminate the rate of Hispanic construction accidents was for the company to *Provide improved safety training*, followed closely by the need for *Hispanic workers to learn English in order to improve communications*. Taken together, these two responses represented more than 70 percent of the total points available.

Hispanic workers provided eight unique responses to the same question, *In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?* These responses ranged from the most frequent, *Workers to focus on the job at hand*, to the least frequent, *Company to impose penalties for safety violations*, and were identified along one axis of a grid. The other axis contained a list of the 47 questionnaires. All responses were entered into a spreadsheet, and individual scores for each of the eight unique responses were recorded. The scores were then totaled and ranked from highest to lowest. Results are shown below in Table 4-6 below.

**Table 4-6: Factors that Contribute to Reduce or Eliminate Job-site Accidents  
(Hispanic Workers' Perception)**

<b>Perceptions of Hispanic Construction Workers About Factors that Contribute to Eliminate or Reduce the Rate of Job-site Accidents Among Hispanic Workers</b>			
<b>Individual Rank</b>	<b>Individual category</b>	<b>Adjusted points</b>	<b>Percentage</b>
1	Workers to focus on the job at hand (avoid carelessness)	64	24.9%
2	Workers to obey safety regulations and wear personal protective equipment	60	23.3%
3	Company to provide more on-site safety measures (signage, cleaning, etc.)	49	19.1%
4	Company to provide more safety and job training (craftsmanship)	48	18.7%
5	Workers to learn English in order to improve communications	19	7.4%
6	Workers should not bring outside (family) problems to the job site	9	3.5%
7	Workers should not rush or do things too fast	5	1.9%
8	Company to impose penalties for safety violations	3	1.2%

Hispanic construction workers' perceptions about how to reduce or eliminate the rate of construction accidents focused on four main factors. In order, these are: *Workers to focus on the job at hand (avoid carelessness)* (24.9%); *Workers to obey safety regulations and wear personal protective equipment* (23.3%); *Company to provide more on-site safety measures* (19.1); and *Company to provide more safety and job training* (18.7). Note that these first four responses, which focus on negligence and safety training represent more than 85 percent of all responses. Improving *English* skills was not considered a factor of high importance in reducing or eliminating Hispanic construction accidents.

#### 4.5 Observational Study

To gain further knowledge about accidents among Hispanic workers in the construction industry, the author visited three different job sites along the Wasatch Front. Two were large commercial projects, including a university student housing complex in Provo, Utah and a new retail mall in Salt Lake City. The third site was a large residence located in West Valley, Utah. One day was spent on each site observing Hispanic workers in their day-to-day construction activities.

Based on these observations, several key factors stood out. The two large construction companies building the commercial projects expended more time and resources on safety. Hispanic construction workers who were employees of these companies were compelled to use personal protective equipment (PPE). Safety orientation meetings and training sessions were an important part of the safety program for these companies. For example, the researcher was invited to participate in one of the training meetings for new workers at the student housing complex. The meeting lasted approximately an hour and focused on workers' using personal protective equipment and remaining alert on the job site.

It was noticeable on the residential project that there was not a focus on safety like there was on the commercial sites. This reinforced the author's personal experience of three years' working on residential construction sites in Utah. Unlike the commercial projects, there was not a safety manager on the residential site; all responsibility for safety was borne by the subcontractors. Additionally, it was obvious that Hispanic construction workers did not wear proper personal protective equipment.

On both the commercial sites and on the residential project, it was observed that most of the subcontractors paid their employees based on piece work. In other words, workers are paid based on production. For example, Hispanic workers are paid per square foot of drywall

installed; the same holds true tile, roof and stucco installations. In order to earn more money, Hispanic workers often ignore job-site safety in favor of higher production rates. This might mean that proper safety procedures are not followed, including neglect in using personal protective equipment. As mentioned above, this attitude of ignoring safety measures was more noticeable on residential projects; however this still occurred frequently on commercial projects. The difference seemed to be that on commercial projects safety managers and superintendents enforced safety procedures more carefully.



**Figure 4-9: Cesar Calvillo (left) Safety Manager and Israel Loayza (right) the Researcher' (Job Site Visited as a Part of the Observational Study)**

#### **4.6 Summary**

Based on the review of literature, several authors have suggested that the language barrier was one of the major contributing factors to accidents among Hispanic construction workers. In this study, contractors/subcontractors, safety managers and superintendents tended to agree with

the findings from the literature review, citing the inability of Hispanic workers to communicate in English as the main cause of accidents (see Table 4-2). On the other hand, Hispanic workers surveyed did not think that language barriers were one of the main causes of construction job-site accidents. In fact, Hispanic workers ranked *Lack of communication/language barriers* only fifth in importance as a contributing factor to job-site accidents (see Table 4-3). Hispanic workers, overwhelmingly considered *Worker negligence* as the main cause of construction accidents (see Table 4-4).

According to the literature review, two other major causes of accidents among Hispanic construction workers were poor skills and native customs or traditions. Consequently, one would expect to find similar conclusions from contractors, safety managers and superintendents. Results of this study seemed to support the literature. In fact, following *Language barriers*, *Lack of training* (poor skills) and *Worker negligence or carelessness* (often based on cultural attitudes) were the two most frequent answers given by. Hispanic workers also agreed that *Lack of job training and experience* and *Cultural issues* were contributing factors to job-site accidents; but where contractors, safety managers and superintendents ranked *Worker negligence or carelessness* third, as mentioned above the Hispanic workers ranked *Worker negligence* first.

Many studies indicated that Hispanic construction workers tended to take on hazardous jobs or were assigned to dangerous tasks, one of the most important causes of accidents among Hispanic construction workers. The same conclusion was reached by some of the Hispanic workers in this study, and *Hispanics work in riskier jobs* was noted as one of the unique causes of accidents (see Table 4-4). However, Hispanic workers' being assigned to hazardous or dangerous jobs was not even considered as a cause of accidents by the contractors, subcontractors, safety managers or superintendents surveyed in this study.

Contractors/subcontractors, safety managers and superintendents indicated that to *Provide improved safety by the company* was the most important thing that could be done to reduce the rate of job-site accidents among Hispanic workers; it accounted for 41 percent of the responses. *Workers to learn English in order to improve communications* and *Workers to obey safety regulations and wear PPE* were considered as the second and the third most important factors to implement in order to reduce or eliminate construction accidents. These two factors accounted 29.5 percent and 11.6 percent of the responses, respectively. Note that the first factor mentioned by contractors/subcontractors, safety managers and superintendents is related to company management procedures. On the other hand, the other two factors have to do more with workers' duties and responsibilities. The fourth highest-scored factor mentioned by the contractors, subcontractors, safety managers and superintendents was *Company to hire bilingual workers or to have translators on site* (see Table 4-5).

Hispanic construction workers surveyed considered personal responsibility and change of attitude as the principal factors to reduce or eliminate construction accidents. For example, *Workers to focus on the job at hand (avoid carelessness)* was the most frequent response (29.4 percent of the responses) to the second main question, *In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?* This was followed closely by *Workers to obey safety regulations and wear personal protective equipment* (23.3 percent of the responses), *Company to provide more on-site safety measures* (19.1 percent of the responses) and *Company to provide more safety and job training* (18.7 percent of the responses).

In summary, responses to the two main study questions given by contractors/subcontractors, safety managers and superintendents were noticeably different than those given by Hispanic construction workers. This seems to indicate that there are significantly

different perceptions between the two groups of respondents about the nature and solutions to construction accidents among Hispanic worker



## **5 CONCLUSIONS AND RECOMENDATIONS**

### **5.1 Introduction**

This chapter reflects the author's findings for the research. A summary of the research is presented first. Next, findings and conclusions based on the results of the data analysis described in Chapter IV are discussed. Limitations of the study are then identified; recommendations for future research are proposed; and finally some thoughts and recommendations are offered.

### **5.2 Summary of the Research**

#### **5.2.1 Purpose of the Study**

The main purpose of this study was to determine why there is a higher proportion of reportable accidents among Hispanic construction workers than non-Hispanic construction workers along the Wasatch Front in Utah. This research also identified perceptions of contractors/subcontractors, safety managers, and on-site superintendents along with Hispanic workers regarding the most frequent causes of reportable accidents among Hispanic construction workers in the same geographic area of study. Once perspectives from both groups were obtained this study analyzed similarities and differences between the groups. This study also identified specific methods or techniques that could be implemented by construction companies

along the Wasatch Front in Utah to improve job-site safety among the Hispanic workforce. Finally, this section will provide suggestions to reduce the rate of reportable accidents among Hispanic on-site construction workers along the Wasatch Front in Utah.

### **5.2.2 Research Design and Methodology**

In order to discover why there was a higher proportion of reportable accidents among Hispanic on-site construction workers than non-Hispanic on-site construction workers along the Wasatch Front in Utah, a questionnaire was developed and administered to selected contractors/subcontractors, safety managers, job-site superintendents and Hispanic workers. The contractors and subcontractors selected for the study were all licensed by the Utah Division of Occupational and Professional Licensing (DOPL). The workers were employees of these licensed contractors. Additionally, the author made an observational study of three construction projects in the geographic region. The observational study objective was to provide a third element of data gathering. These three steps, including surveys of the two different groups in addition to the observational site visits, were combined in a process called triangulation. By triangulating the methods, the findings of the study should be considered more accurate and valid. The study involved a sample of eighteen construction projects located along the Wasatch front in Utah. Forty-seven Hispanic construction workers, a sample of the workforce of these construction projects, were also part of this study.

### **5.2.3 Composition of the Questionnaire**

Two main questions comprise the foundation of this research.

*Question 1:* In order of importance (most important to least important), what do you think are the three things that contribute most to job-site accidents among Hispanic construction workers?

*Question 2:* In order of importance (most important to least important), what three steps should be taken to reduce or eliminate job-site accidents among Hispanic workers? In addition to the two main research questions, demographic information for contractors/subcontractors, safety managers, job-site superintendents and on-site Hispanic construction workers was collected and reported.

## **5.3 Findings and Conclusions**

### **5.3.1 Findings for Perceptions of Contractors, Subcontractors, Safety Managers and Superintendents**

Eighteen contractors, subcontractors, safety managers and superintendents were selected to participate in this study and discuss their perceptions about what things contribute to job-site accidents among Hispanic construction workers. It was evident that contractors, subcontractors, safety managers and superintendents believed that the most important factor responsible for the high rate of construction accidents among Hispanic construction workers was the lack of training. Other factors considered critical in the causation of accidents among Hispanic workers were language barriers, lack of safety measures and negligence.

The results of the literature review seem to indicate reasons in addition to those reported by the contractors, subcontractors, safety managers and superintendents. For example, according

to the conclusions of many authors and experts addressing the causes of accidents among Hispanic workers, language barriers seem to be the primary cause of accidents. Other specific factors noted included lack of training, lack of safety measures, poor job skills, customs, and traditions, to name a few.

When discussing the steps that should be taken to reduce or eliminate job-site accidents among Hispanic workers, contractors, subcontractors, safety managers and superintendents believed that the most important factor to implement or focus on was improving safety training methods. Other factors considered as highly important to reduce or eliminate accidents among Hispanic workers were to improve communication and place a greater emphasis on safety. These responses corresponded to recommendations made by many authors in the body of literature who suggested improved safety training methods. Some authors believed that the causes of the high rate of accidents among Hispanic construction workers was an area still open to research. As a consequence, they recommended further initiatives to collect qualitative and quantitative data from employers, construction workers, union members, and community officials to clarify the reasons of the high rate of occupational accidents among Hispanic construction workers.

### **5.3.2 Findings for Perceptions of Hispanic Construction Workers**

Hispanic construction workers who participated in the survey shared their perceptions about the high rate of construction accidents among Hispanic workers. It was interesting to discover that Hispanic construction workers surveyed believed the most important factor responsible for the high rate of construction accidents among Hispanic construction workers was negligence and issues related to carelessness. Some other factors considered critical by the Hispanic workers in relation to the origin of accidents among Hispanic workers were related to

health and personal problems, lack of job training and experience, lack of job-site management, lack of safety measures, and language barriers.

In relation to reducing or eliminating job-accidents among Hispanic workers, the Hispanic construction workers believed that the most important thing they could do was to focus more on their tasks. Other factors considered as highly important to reduce or eliminate accidents among Hispanic workers were to obey safety regulations, wear personal protective equipment, receive better safety training from their companies, and to learn English to improve communications.

#### **5.4 Limitations of the Study**

This research was intended to identify the causes of the high rate of accidents among Hispanic construction workers along the Wasatch front in Utah. The study was limited in at least one important way. Even though the research was intended to explain the phenomenon of construction accidents among Hispanic workers in a general way, because there are so different ways to address this topic, it was impossible to address all possible issues in one study. This study ultimately did not differentiate between the residential and commercial construction sectors. The development of specific studies in each of these areas may represent topics for future research.

## 5.5 Benefits of the Study and Recommendations for Further Research

This research has established a foundation for future studies into the complex field known as “Hispanic workforce injuries and fatalities” and is beneficial for at least two reasons: First, through this study the author was able to determine that perceptions regarding construction accidents among contractors/subcontractors, safety managers, and superintendents were not necessarily the same as those of Hispanic workers. This is an important factor, because it is clear that the workforce is not in agreement regarding the cause of accidents among Hispanics. This represents an obvious challenge in determining ways to manage safety for Hispanic workers on the job site. Second, commercial construction companies in general are more progressive in looking for ways to improve job-site safety measures, and this study has identified interesting methodologies implemented by these commercial construction companies. Following is a list of some of these methods and some suggestions to improve safety among Hispanic construction workers:

- Hispanic construction workers who have received safety training should have a visible sticker on their helmet. This sticker is awarded to qualified workers exclusively by the construction company and has the inscription, *I've received training*. Thanks to this procedure, safety managers and superintendents can recognize who is working with or without training.
- Construction companies should offer safety bonuses to Hispanic workers if at the end of the project they, as a team, have achieved the goal of *zero accidents*. Generally Hispanic construction workers appreciate and will work toward economic rewards and bonuses.
- Where possible, construction companies should have a sufficient number of bilingual workers on the job site who wear a specific color of helmet. The purpose of this is to let

Hispanic workers know that if they have any questions or concerns because of language barriers, there will always be a translator nearby.

According to the data gathered, Hispanic construction workers considered negligence as the main reason for construction accidents. Respondents attributed this behavior to the fact that Hispanic workers try to work faster than they should because compensation is often tied to production. One of the main reasons Hispanic workers try to work faster than they should and experience a higher rate of accidents than non-Hispanics is that they feel a pressing need to provide financial support not only for immediate family members in the United States but also for extended family who still live in their native countries.

It would be wise for contractors/subcontractors, safety managers and superintendents to understand this practice so they can reinforce the importance of safety training, placing more emphasis on the consequences of not considering safety in the first place. It must be stressed that if a worker is injured, that worker will not be able to provide for family members.

## **5.6 Final Thoughts**

The problem of construction accidents is a worldwide concern; however, because of the immigration phenomenon in the United States of America construction company owners are faced with complicated challenges regarding safety on the job site. People from different cultures and languages enter the construction workforce in increasingly larger numbers each year. Because Hispanic workers represent the highest number of these working immigrants, it is necessary for construction companies to develop new and effective systems to deal with the high rate of construction accidents among Hispanic workers. Not only are new programs needed to

address this issue, expanded research into the topic of construction safety among Hispanic workers is also recommended.

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## APPENDIX A.

### *Worker Questionnaire (Cuestionario del trabajador)*

This section will collect a little information about you. (Esta sección le pedirá corta información sobre usted)

Where were you born? *¿En qué país nació usted?* \_\_\_\_\_

How old are you? *¿Cuántos años tiene?* \_\_\_\_\_

What is the highest level of formal education you have? (Elementary, Junior High, High school, University)

*¿Qué nivel de educación formal tiene?*

Inicial

Primaria

Secundaria

Superior/Universitaria

How fluent are you with the English language? (I don't understand English, I understand and speak a little English, I understand and speak passable English, I understand and speak English very well.

*¿Qué tanto usted domina Inglés?*

No entiendo inglés

Entiendo y hablo un poquito de inglés

Entiendo y hablo moderadamente inglés

Entiendo y hablo inglés muy bien

How long have you been working in the construction Industry? (Less than one year, one to five years, six to ten years, eleven to fifteen years, more than fifteen years).

*¿Cuánto tiempo usted ha estado trabajando en la industria de la construcción?*

Menos de un año

Entre uno y cinco años

Entre seis y diez años

Entre once y quince años

Más de quince años

How long have you been working in construction in the United States? *¿Cuánto tiempo usted está trabajando en la construcción en los Estados Unidos de América?*

\_\_\_ años

In what trades in the construction industry have you had significant experience? *¿En qué ocupaciones de la construcción usted tiene mayor experiencia?*

---

In order of importance (most important to least important), what do you think are the three things that contribute most to job-site accidents among Hispanic construction workers?

*¿En orden de importancia (más importante a menos importante) cuales cree usted que son las tres cosas que contribuyen más para que ocurran accidentes de construcción en los trabajadores Hispanos?*

---

In order of importance (most important to least important) what three steps should be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?

*En orden de importancia (más importante a menos importante) ¿cuáles son los tres pasos que se deben dar para reducir o eliminar los accidentes de construcción en los trabajadores Hispanos?*

---



## APPENDIX B

### *Contractor/Subcontractor Questionnaire*

Following are questions contractors and subcontractors will be asked.

“This survey is for a master’s thesis research project in Construction Management at Brigham Young University. The data collected from the survey focuses on the rate of accidents that Hispanic construction workers face in the workplace. The survey is designed take approximately five minutes.

Participation is voluntary. Your personal information will be kept confidential. If you have any questions concerning this survey or research, please contact Brigham Young University’s Institutional Review Board, A-285 ASB Provo Utah 84602 (801) 442-3841/Fax: (801) 422-0620.

### **Contractor /Subcontractor information**

This section will collect a little information about you.

How many years have you been in the construction industry?

Less than one year

One to five years

Six to ten years

Eleven to fifteen years

More than fifteen years

(If a trade contractor or subcontractor) How many years in the trade?

Less than one year

One to five years

Six to ten years

Eleven to fifteen years

More than fifteen years

In order of importance (most important to least important), what are the three things that contribute most to job-site accidents among Hispanic construction workers?

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In order of importance (most important to least important) what steps can be taken to reduce or eliminate the rate of job-site accidents among Hispanic workers?

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What percentage of your total on-site workers is Hispanic?

\_\_\_\_\_ %