

A Conceptual Model of the Perceptions of Hispanics in the US Construction Industry

Matthew D. Reyes, MS, CPC and Somik Ghosh, PhD

University of Oklahoma
Norman, Oklahoma

The number of Hispanic workers in the construction industry is increasing in concert with the overall Hispanic population in the US. In the last twenty years the number of Hispanic workers has almost tripled in the US construction industry totaling well over two million. However, disparity is evident in the proportion of Hispanics in managerial positions in contrast to non-Hispanics within the construction industry. This disparity seems to be uniquely attributable to ethnicity as formal education does not play a major role. The authors used the social dominance theory as the point of departure to propose a conceptual model of the perceptions of Hispanic workers in the construction industry. The conceptual model is based on four hypotheses listed in the paper. Data collected from more than two hundred participants through a structured questionnaire was used to test the goodness of fit for the proposed model. The fit statistics of the initial model was not significant and the recommendations were not meaningful. However, a few of the recommendations reinforced the theoretical underpinning of the model. The future work will include modifying the model based on the initial fitness statistics and including larger sample size.

Key Words: Construction Workforce, Hispanic Workforce, Social Dominance Theory, Ethnic Disparity

Introduction

The Pew Research Hispanic Center (<http://www.pewhispanic.org>) estimates that there will be 60.4 million Hispanics living in the United States by the year 2020. This accounts for a substantial growth of the overall population in the nation. The expected growth of the Hispanic population will have its effect on the demographics of the US workforce as well. It is estimated that by 2050 Hispanics will constitute 25% of the workforce in the US (Vazquez & Stalnaker, 2004). The proportion of Hispanics working in all industries in the US doubled from 1990 to 2010, growing from 7% to 14%. In the same time frame, the proportion of Hispanics working in the construction industry nearly tripled, from 9% to 24%, to bring the total number of Hispanics working in the construction industry to 2.2 million (CPWR, 2013). This number is likely to increase as the construction industry grows and continues to recover. The impact of the population growth pattern stands to greatly influence the construction industry.

While it is expected that the number of Hispanic workers in the construction industry will increase as the nation's overall demographics shifts, there is a challenge in the types of jobs within the construction industry that are readily and reasonably available to Hispanics. The construction workforce overall is very unbalanced where the management jobs are overwhelmingly occupied by white, non-Hispanics. While 7% of Hispanic workers were employed in managerial positions, 24% of non-Hispanic workers were in such positions (CPWR, 2013). The proportion of Hispanics working as construction laborers is disproportionately higher. About 26% of Hispanic workers were employed as construction laborers compared to 13% of all construction workers (CPWR, 2013). Some of the positions require a good deal of skill but they are nonetheless regarded as blue collar jobs. This also is not necessarily a problem as an isolated fact. The problem is in the opportunities for advancement into management roles that are available for Hispanics in the construction industry. This problem seems to be uniquely attributable to ethnicity as formal education is not a major consideration. An individual can move up the ranks from laborer to carpenter to superintendent (typically considered a management position) when only rarely holding a college degree (Gunderson, Barlow, & Hauck, 2007). It is also not uncommon for a superintendent to not even hold a high school diploma. Since a lack of formal education is not a hindrance to advance to a managerial position in the construction industry, other barriers must be inhibiting Hispanics from advancing.

The authors believe that the disparity between field personnel (laborers) and office personnel (management) will continue to widen as the demographics shift if a concerted effort is not made to enhance opportunities for Hispanics to obtain management positions. To remove the disparity, it is important to identify the barriers followed by developing interventions to reduce the barriers. While identifying the barriers and developing the intervention is the overarching goal of the authors, the focus of this paper is to create a conceptual framework about how Hispanic workers are perceived by non-Hispanic workers.

In the following sections, the paper presents the different variables of the conceptual model and how they impact the perception of non-Hispanic construction workers towards their Hispanic counterpart. For the purposes of this paper, the term “Hispanic” refers to ethnicity rather than race and follows the definition of the US Census Bureau. A Hispanic individual is “a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race” (US Census Bureau).

Research Strategy

The contributing factors towards social disparity can be grouped under several categories such as racial identity (Caldwell, et al., 2004), economic circumstances (Nazroo, 2003), education level (Boudon, 1974), and similar. Incidentally these are characteristics of both the dominant and subordinate groups that impact disparity. One of the factors that contribute towards the disparity is that of social dominance orientation. A person’s social dominance orientation is a psychological orientation that has been found to impact the attitudes and behaviors between societal groups. Social dominance orientation, which is an individual’s preference for a hierarchy among social groups rather than equality between groups, correlates strongly with racism (Cokley & Tran, 2010) and impacts group relations. It also has implications on individuals’ ideological justifications for disparity and the psychology of group prejudice (Ho, et al., 2012). The social dominance theory has been used as a point of departure for the current study. The current paper focuses on a single idea rather than trying to tackle the entirety of social disparity that Hispanic construction workers face. In this context it is important to understand that one group’s own beliefs and attitudes could affect the opportunities of another group in society.

The authors followed a systematic literature review to identify the different variables that can contribute towards the perceptions of the non-Hispanic construction workers. The variables considered for the study are discussed below with their roles in the development of the perceptions.

Ethnic Background

As the perceptions of a certain ethnicity are being investigated, it was hypothesized that one’s own ethnic background would impact these attitudes and perceptions. While it is possible to break ethnic background down into many categories, only “Hispanic” and “non-Hispanic” were looked at for this study. It is possible that each ethnicity would interact differently with perceptions. However, the desire was to find out if ethnic background played any part at all before conducting further research on how a variety of ethnic backgrounds work together to predict perceptions, if at all.

Knowledge of Spanish

Since the dominant language among Hispanic construction workers is Spanish (CPWR, 2013), it was hypothesized that a person’s own knowledge of Spanish would affect perceptions. This is for several reasons. Firstly, knowledge of the language of a culture necessitates at least some understanding of how that culture works even if it is limited. This knowledge of the culture would tend to alter perceptions of the people that come from that culture. Additionally, if one has an understanding of a culture’s language, he would tend to interact more with people from that culture. If someone has even a small knowledge of Spanish then they would be more likely to interact with the Hispanic individuals on a construction site. This interaction with the workers on their terms and in their cultural context would lead to a greater understanding of not only that person but that culture and perceptions would be greatly impacted.

Multicultural Experiences

Factors such as travel and interactions with people from other cultures were grouped into the category of “Multicultural Experiences” for this study. These are factors such as the amount of times an individual has traveled abroad overall and also specifically to Latin American countries. Other factors include how much individuals tend to interact with people from other cultures. For this study the interaction with other cultures was measured as the amount (on a relative and self-reported scale) of Hispanics that participants grew up around and currently have in their circle of friends and acquaintances.

Construction Industry Experience

Since this study is investigating perceptions of Hispanics specifically in the construction industry, it was hypothesized that a participant's experience in the construction industry would impact perceptions. The more that an individual has worked in construction, the more that they would understand the inner workings of the industry and how the labor force is divided. Additionally, more construction industry experience would also lead to more interaction with Hispanic construction workers which would also impact perceptions. Not only was the amount of construction industry experience looked at but also the type of experience was taken into consideration. The type ranged from only field experience to only office experience. The supposition was that the amount of daily interaction with personnel on a construction site that is predominantly Hispanic would have a high impact on perceptions.

Social Dominance Orientation

A modified version of the social dominance orientation scale was used. Sub-factors such as political conservatism, zero-sum competition, and old-fashioned racism were considered (Ho, et al, 2012). The reason for the inclusion of social dominance orientation in the measured variables was that it is historically a strong indicator of intergroup attitudes and perceptions. The goal was to find whether an individual's traits outside of things that they have learned (such as *knowledge of Spanish*) or done (such as *multicultural experiences and construction industry experience*) would have an impact on perceptions.

Perceptions of Construction Workers

In this category there were two variables that were sought after: perceptions of Hispanic construction workers and perceptions of non-Hispanic construction workers. The reason for this dichotomy was to enable differentiation of perceptions of Hispanics in construction from perceptions of construction workers in general. Just as the ethnic background variable was only broken into two categories, the perceptions of construction workers was likewise only broken down into two categories, namely Hispanic and non-Hispanic.

The degree to which these two variables relate to one another or are predictive of one another will be indicative of participants' perceptions. To some extent, the variable of perceptions of non-Hispanics is used as a control variable.

Data Collection and Analysis

To gather data, a 50 item survey instrument was developed using an online tool. After assessing the data and taking a closer look at the objectives of the study, some of the variables were discarded. The sample size consisted of completed responses from 34 participants. Incomplete responses (those with more than 5 data points missing) were discarded using listwise deletion. After removing the incomplete responses, the missing data rate was 1.5% and appeared randomly and not in groups. The data was replaced using mean imputation. Participants were recruited via convenience sampling. Due to the exploratory and conceptual nature of this project, a smaller sample size was used so that a larger pool of participants can be recruited for the subsequent tests.

Once data were compiled, they were analyzed using SPSS for descriptive statistics and checks of normality. After the preliminary analyses, the foundations of a structural equation model were developed. A confirmatory factor analysis was done using LISREL to determine how the measured variables loaded onto the theoretical factors. These factors were then used to create a path diagram to compare to the hypothesized theoretical model.

Three factors were retained after the factor analysis to be used as exogenous variables. For the initial analysis, the factors that are applicable to a learning environment were retained as they are the variables that can be manipulated and expanded in the instructional setting. These factors were *Knowledge of Spanish*, *Multicultural Experiences*, and *Construction Industry Experience*. The rationale behind retaining these variables for the initial analysis is that students can be taught Spanish, extra-cultural experiences can be encouraged or required as can field work or experience.

Hypotheses

The conceptual model of perception on non-Hispanic as shown in Figure 1 is based on a few hypotheses. The hypotheses are listed below.

H1: The *Knowledge of Spanish* variable is predicted to act as a positive predictor of *Perceptions of Hispanic Construction Workers*. The thought behind this hypothesis is that the more familiar an individual is with

the Spanish language the more highly that individual will regard people from cultures where that language is spoken.

- H2:** The *Multicultural Experiences* variable is predicted to act as a positive predictor of *Perceptions of Hispanic Construction Workers*. The thought behind this hypothesis is that the more interaction an individual has had with another culture (and just experiencing a culture other than their own) the more favorably that individual will perceive that culture and other cultures.
- H3:** The *Construction Industry Experience* variable is predicted to act as a positive predictor of *Perceptions of Hispanic Construction Workers*. The thought behind this hypothesis is that the more experience an individual has in the construction industry, the more that individual will empathize with and have favorable perceptions of others that work in that industry, regardless of race or ethnicity.
- H4:** The *Construction Industry Experience* variable is predicted to act as a positive predictor of *Non-Hispanic Construction Workers*. The thought behind this hypothesis is that the more experience an individual has in the construction industry, the more that individual will empathize with and have favorable perceptions of others that work in that industry.

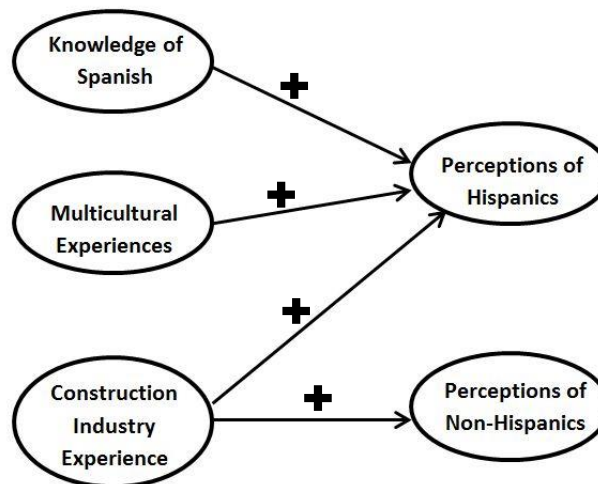


Figure 1: Hypothesized Model

The data were first screened for both univariate and multivariate normality. Normality, in this context refers to the basic statistical concept of normal distribution. A dataset with normal distribution, if plotted, will exhibit the shape of a bell curve. While univariate distribution refers to the distribution of a single random variable, multivariate distribution refers to a group of random variables. There were some issues with univariate normality as the variables of *Spanish in high school*, *Hispanics in participants' high school*, *travel abroad (all)*, and *construction experience years* had p-values of less than 0.05, which indicates the normal distribution of the data. This is not hugely unexpected given that *Spanish in High School* was a dichotomous variable. Even though *Construction Experience Years* is a continuous variable, only a couple options could reasonably be expected from the sample. The remainder of the variables demonstrated univariate normality at $\alpha = 0.05$. The test for multivariate normality yielded satisfactory results with a p-value of 0.305.

Following the tests of normality, a confirmatory factor analysis was run using LISREL. Confirmatory factor analysis is used test whether measures of a construct are consistent with the construct of the factors in the hypothesized model. The measured variables were loaded onto five factors, which are the latent variables mentioned above. With a Root Mean Square Error of Approximation (RMSEA) equal to 0.17, the model didn't fit all that well but it is believed that this is due to the limited sample size and the need for an improved instrument. A value of about 0.05 or less of RMSEA, a measure of fit introduced by Steiger and Lind (1980), indicates a close fit of the model in relation to the degrees of freedom (df). The Chi-Square test yields a value of 109.32 which, evaluated with 55 degrees of

freedom has a corresponding p value of 0.0002. The relation of the latent variables and the measured variables are shown in Figure 2 as output by LISREL.

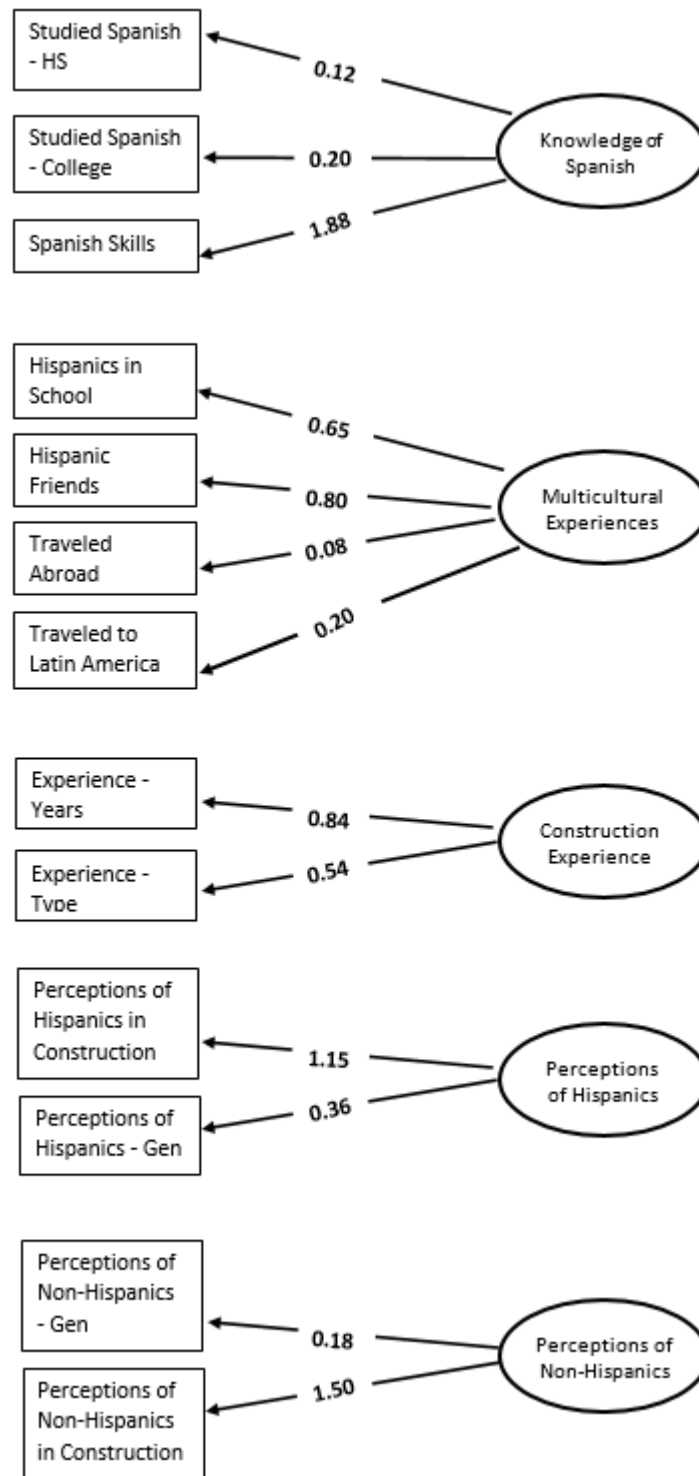


Figure 2: Confirmatory Factor Analysis

A path analysis was then run to analyze the relationships among variables. The theoretical model with all the observed variables (represented as rectangles in the model) and the latent variables (represented as ellipses in the model) were input first and the fit was assessed. The fit test yielded an RMSEA of 0.171 (> 0.05). Other fit statistics did not demonstrate a good fit with a Normed Fit Index (NFI) of 0.415 and a Comparative Fit Index (CFI)

of 0.556, both indicators of poor incremental fit over a null model. NFI, which is the difference of the two models' Chi-Squares divided by the Chi-Square of the independent model must have a value 0.9 or higher to indicate good fit. The CFI is a similar index and is appropriate to be used with smaller sample size. However, in order to indicate good fit the value of CFI has to be 0.9 or higher. The relationships between the latent variables is indicated in Figure 3.

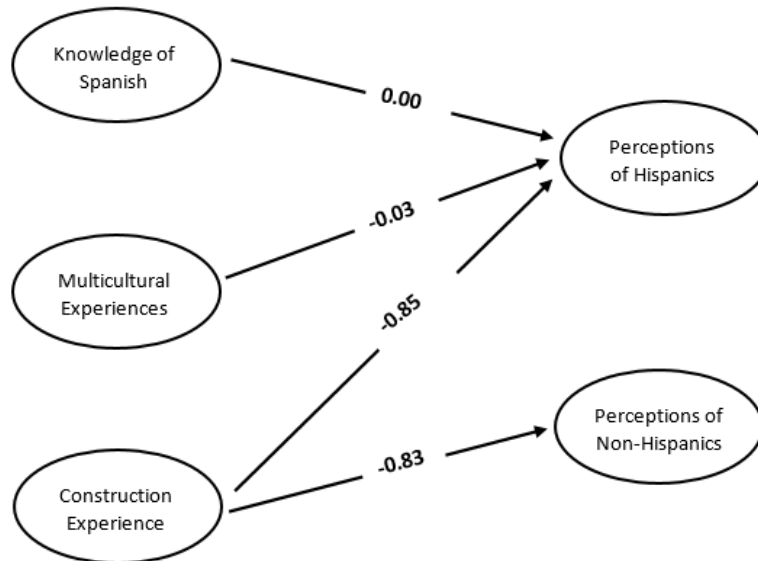


Figure 3: Test of the Hypothesized Model

After looking at the fit statistics for the hypothesized model, some residuals were looked at and considered. Some of the recommendations based on residuals of where to force variables to load didn't make good theoretical sense (such as the recommendation to have *Travel Abroad* load onto the latent variable *Construction Industry Experience*) so these changes were not made.

Further research will focus on re-specifying and testing the model. Authors will make modifications to the model based on the initial fitness statistics and will include a larger sample size.

Conclusions

The initial model did not fit well but it is still possible to draw some preliminary conclusions and the model provides some insightful information. Not surprisingly, the variables *Spanish Skills* and *Multicultural Experiences* positively predict *Perceptions of Hispanic Construction Workers*. Somewhat surprisingly, *Construction Industry Experience* negatively predicts *Perceptions of Non-Hispanic Construction Workers*. This was contrary to what was hypothesized.

The output that *Construction Industry Experience* negatively predicts *Perceptions of Non-Hispanic Construction Workers* is likely indicative of the kinds of interactions that participants have had with construction workers. Since it is about non-Hispanics, it is not an ethnic issue. Perhaps it is based on societal stereotypes and prejudices that are not ethnically based but socioeconomic based. The results indicate that participants have a category carved out for construction workers that is not necessarily one of high esteem.

The fact that *Perceptions of Non-Hispanic Construction Workers* is the strongest predictor of *Perceptions of Hispanic Construction Workers* is also telling. It aligns with the previous discussion of a category for construction workers. Rather than a group of variables impacting how participants viewed Hispanic construction workers, the perceptions about construction workers as a whole impacted the perceptions of a particular subset of construction workers.

These results are telling in that it may not be an effective strategy to try and impact the perceptions that students have about Hispanics in construction as an isolated construct. Perhaps the first thing to address is the stereotype of the construction worker in America, disregarding ethnicity. Once that has been addressed, the perceptions of Hispanics can specifically be addressed. A possible result of this mindset is that Hispanics in construction are automatically lumped into the category of field construction worker and it is hard to break out of that mold and advance. It could also be that the barriers to advancement for Hispanics are not necessarily tied to the need to break out of being identified as a Hispanic individual but rather as a field worker and nothing more.

Future Research

The results from this analysis have given good indications of improvements to be made to the instrument. This pilot study served to provide a framework for a larger scale study and has informed how to best set up future analyses. Additional items have been developed for a new instrument that will yield clearer results. The revised instrument also includes more items to get better data on the true perceptions of individuals. It has been sent out to a variety of individuals and the future research will include a much larger response set. The results from the future research will inform the design of training and orientation sessions for individuals working on multicultural construction sites. A better understanding of inherent beliefs and perceptions will serve to improve the quality of interventions for those interacting with Hispanics and Non-Hispanics alike on construction sites.

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