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## The effects of nationality in the intercultural relationship in a maquila environment, cultural dimensions a practical approach

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THE EFFECTS OF NATIONALITY IN THE INTERCULTURAL RELATIONSHIP IN  
A MAQUILA ENVIRONMENT, CULTURAL DIMENSIONS A PRACTICAL  
APPROACH

A Thesis

By

DANIEL REYNOSO ORTIZ

Submitted to the Graduate School of the  
University of Texas – Pan American  
In partial fulfillment of the Requirements for the degree of

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Major Subject: Manufacturing

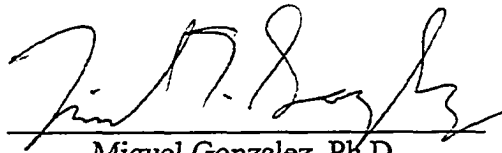
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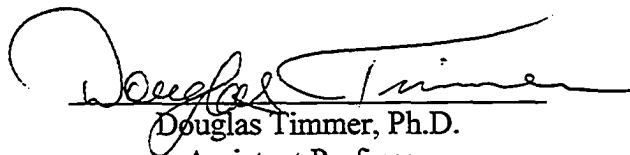
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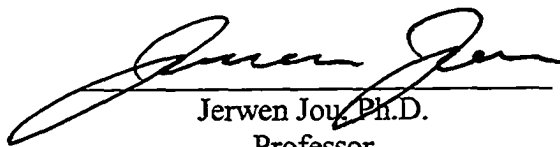
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## ABSTRACT

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The Maquiladora Industry has enhanced economic development in the U.S. and Mexico border region. Initially, investors came to set up assembly lines requiring a small amount of technical skill; however, increases in the technological level of products have created the need for companies to require more technical expertise from their staff. Today, the requirement is for the design or redesign of some of their products and the manufacturing processes required to make these products. This brings managerial problems in dealing with technical people in cross cultural environments. These problems deal with staffing issues such as getting the right people and keeping them within the company. For this research, a description of the differences between members of maquila companies with different countries of origin, and to what extent these cultural differences have some influence with Mexican staff is presented. This research presents an analysis of the motivational policies and the influence of cultural differences when dealing with these problems in the maquila industry. In addition, recommendations for changes based on a statistical analysis of the cultural differences and a methodology to analyze which factors will have an influence in the motivation of Mexican staff working in cross cultural

environments such as the maquila are shown. These methodologies should provide a tool for a better professional staff motivation.

## DEDICATION

I dedicate this thesis  
to my beloved wife.

Addis

## ACKNOWLEDGEMENTS

I want to express my appreciation to my committee co-chairs, Dr. Miguel A. Gonzalez, Dr. Douglas Timmer, and Dr. Jerwen Jou. I would like to thank Dr. Miguel A. Gonzalez for his assistance throughout each phase of this project and Dr. Jerwen Jou for his patience and enthusiasm in sharing his knowledge. Thanks to Dr. Douglas H. Timmer for his assistance in this project. Special thanks to Mr. Arnoldo Padron for his assistance in this project. This project would have not been accomplished without the support from the Writing Center at UTPA. Acknowledgement is also due to Ms. Angie de Loach for her assistance with the technical writing of this project.

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## CHAPTER 1

### INTRODUCTION

The objective of the introductory chapter is to provide an overview of the subject matter of this thesis. The chapter consists of two sections of the thesis. The first section states a description of the problem. The second section describes the objectives of the research conducted for the thesis and a brief summary.

#### 1.1 Problem Description

In the actual world, sophisticated technologies exist so that organizations can improve their production of goods and provide better services to maintain their market share or improve their position on it. To achieve this objective, the companies must obtain the best results with the least effort. This reduced effort will improve the productivity of the company, which leads to higher profits. In order to produce goods, several factors are needed in the capitalist production system: a facility with all the equipment needed to transform raw materials to finished goods, a consumer market where these goods may be sold, and most importantly, the human resources to manage all the machines and systems that transform the raw materials into finished products.

The human factor is the most important of all the factors of this economic system. The main reason is that the goods produced in the actual economy will satisfy human

needs, either directly or indirectly; therefore, in a productive process the human being is the beginning and the end of the process. The human is a complex being that can be motivated by other things besides the need for food and shelter. This means that most of the people who add themselves to a productive process will expect rewards that cover their needs. These needs could be very different from one person to another, but a group of persons could show particular needs according to specific factors, such as academic preparation, gender, marital status, and other sociological and cultural factors. For example, in most cultures, persons with bachelor's degrees will expect to have an economic income higher than those without a professional degree. The motivating factors are a kind of Holy Grail in industrial engineering studies. Maslow[1] developed a theory establishing the needs that motivate the human being. He [1] stated, "human needs arrange themselves in hierarchies of prepotency. That is, the appearance of the one need usually rests on the prior satisfaction of another." These needs were arranged by Maslow[1] as a stair step function, as shown in figure 1.1.



Fig. 1.1 Maslow's hierarchy of needs

Maslow's [1] hierarchy of needs classifies the human needs in a straight and simple manner. Human behavior is driven, among other things, by inside motivators such as those indicated by Maslow [1]. Hofstede [2] considers that other factors, such as culture and practices, have a large influence on the person's daily behavior. Thus, Hofstede [2] considers that besides the physique of the individual, the "mental programming" or values and practices learned at early ages could explain the reason for a person's behavior and practices in society. Another example of the mental programming effect on the cultural difference was found by Whitehall [4]. He concluded that Japanese workers and American managers must learn and adapt themselves to different ways of perceiving authority, dealing with work relationships, establishing wage levels, and compromising between company and employee. These observations made by Whitehall [4] can be corroborated with the study developed by Yoshino and Ewing [4]. In this study, the researchers describe the potential problems when foreign companies established Western type reward policies in Japan. There are several examples like these that deal with the effects of intercultural cohabitation in the motivation of employees at overseas facilities. Unfortunately, motivation theories are largely influenced by the author's native culture; therefore, what can be completely true for a particular culture can be completely different for another culture.

Motivation by itself is a significant theme to study; in this thesis, motivation was considered as a result of several factors. Among these factors, culture seems to be a particularly strong issue. Several studies exist about motivation with the goal of finding the motivational source(s). This source(s) can grant information for different topics, such as marketing and the military environment. A practical function of this information is to



determine a predictive method to understand the factors that motivate human actions, such as loyalty to a company. The function of an employee in any labor relationship is to sell or rent his knowledge or physical effort in order to transform raw material into a secondary good.

Earlier management theories, such as that of Herzberg [3] and Maslow [1], consider wage or biological necessities related to the income as the first motivator. Many social revolts occurred because of poor income levels, bad working conditions, and basically over-exploitation of human resources. Economic need is the main reason why most hire themselves to a company. Any person who has ample economic income will not likely work for another person. Probably, he or she will engage in those activities that make him/her happy. On the other hand, those persons that work for a company or any organization will prefer to be in an organization that offers the best conditions to cover their needs, which can be economical, cultural and/or social. At this point, management plays an important role, from keeping the employee happy to keeping productivity at an acceptable level. Culture plays an important role here; besides the personality of managers, their cultural background will have a strong influence in how managers cover the needs of their employees.

Other investigations about motivation discuss a contingent worker versus a permanent worker [6]. Some deficiency of the Allan and Stephen article is how they analyze the information that they gather. They consider factors such as wage income and task difficulty as independent values. Motivation is not solely the result of the income level on the type of work developed. One can consider that all these factors are dependent. Wage will be normally the most important factor during employment, but

secondary factors will determine the overall level of satisfaction when a human being performs a task.

## 1.2 Problem background

### 1.2.1 The maquila background

The maquiladora industry is one of the most recent evolutions of the capitalist economic system. The main goal of maquila companies is to assemble systems designed by a foreign company in facilities located in Mexico. The raw materials of those systems are designed outside of Mexico under specific governmental rules and laws. The process of this governmental rules system is described as follows:

Maquila is derived from old Spanish agrarian economy in which the owners of grain mills would charge farmers for processing their grain. Basically the mill owners would take a portion of the final product out of the production. The measure used to take out that portion was known as maquila (Gonzalez [7]).

The modern concept of the maquila started in 1965 when the Mexican government provided tariff incentives to Mexican and American companies to set up shops on the border. This border Industrialization Plan was developed by Arthur D. Little (Fernandez-Kelly [34]). The concept is simple: each factory would be treated as an individual foreign processing zone, thereby allowing the plant to import, duty free, all production related equipment and materials into Mexico. The company would then export all of its production out of the country. Upon return of the production to the United States, the United States' government would then place duties on only the value added to goods

produced with American raw materials and equipment. At the beginning, there were rigid restrictions as to how the plants could operate. The companies should be owned and operated by Mexican Nationals. Strict accounting for import/export components still exists. Maquilas have evolved from pure low-tech work to an extensive list of industrial products. Originally, maquiladoras were based on a "Twin Plant" concept: a facility in the United States and a facility in Mexico. The American facility was basically a staging and finishing facility. The Mexican facility would assemble raw materials into sub-assemblies and/or finished products that were then exported.

Today, maquiladoras are more engaged in transforming their own raw materials into finished goods and exporting most of their production. There is also a large segment of the industry devoted to repair. The advantages of the maquila system are the low cost labor, and the geographical position of the maquila close to the American market, which is the main consumer of the goods made in the maquiladora. As was mentioned earlier, the maquiladora started as low-tech facilities, and a low level of training was offered. The economic importance of the maquila is reflected in the following data by Gonzalez [7]):

- There are approximately 3,800 Maquiladoras.
- They employ 1,240,840.
- They generate more than 1 billion a month in value added to products.
- They spend 800 million a month in salaries.

The maquiladoras are considered the third largest economic income of Mexico, behind oil and raw material exports. Table 1.1 shows the extension of the products produced at maquila facilities.

Table 1.1 Maquila demographics (INEGI [9] 2001)

Industry	Num. of Plants	Num. of Employees
Food Processing	81	10,324
Textiles and Apparel	1131	282,782
Shoes and Leather Goods	63	8,222
Furniture and Parts	402	62,670
Chemical Products	155	25,360
Automotive Parts	268	226,242
Equipment & Tools (Non Electric)	57	15,102
Electronic Machinery & Equipment	170	94,834
Electronic Materials & Accessories	585	314,015
Toys & Sporting Goods	59	14,593
Other Manufacturing Sectors	545	143,718
Services	245	45,327

For the American government, this program (maquiladora) gives the United States the opportunity to diminish the illegal immigration from Mexico into the United States. For the Mexican government, the goal is to develop an industrialized area on the border that could offer work positions to a growing population. Other objectives of the Mexican government include the need to generate tax income from the labor employed in the maquila, and to absorb the labor left unemployed after the termination of the "Bracero program" (Fernandez-Kelly [34]). Mexican and American investors had a unique opportunity to get a profit from offering secondary services, either for the maquila or for the maquila employees (grocery facilities, housing, transportation, etc.) and diminish assembly cost with the lower wages of the Mexican labor.

In recent years with the implementation of NAFTA, some changes to the procedures for the maquila were introduced. Partial sale of finished goods was allowed in the domestic market, or even full production in some special cases. NAFTA, instead of diminishing the maquila number, promoted a larger growth of these facilities. In 1965, there were 12 offshore plants (pilot plants) in all of Mexico; by 1975, there were 454 “maquilas” operating, (418 on the border) with 3,087 employees; in 1977, a total of 443 maquila plants with 78,433 employees were established; and by 2001, 3,761 maquila operations employed 1,240,840 people throughout Mexico (INEGI [9], Fernandez-Kelly [34]). Not only do American companies form part of the maquila, but the maquilas involve several nations of which the most important include North American, Japanese, British, German and Korean companies (see table 1.2). This multinational work area has created new management, as well as technological and cultural opportunities. Therefore, it is important that studies about the effects of the cross-cultural relation be developed because the tendency of these types of manufacturing systems is to grow in the next decades.

Table 1.2 Foreign Direct investments in Mexico ([13] Twomey).

	1960	1970	1985	1997
U.S.A	83%	79%	70%	60%
Canada	2%	2%	25%	3%
U.K.	5%	3%	4%	3%
Other Europe	7%	13%	18%	20%
Japan	0%	1%	3%	2%

### 1.2.2 The motivation and the cultural interaction

With the development of new technologies and quality methodologies, these maquila facilities require more professional personnel to fulfill their goal. The lack of technical staff on the Mexican border is a potential problem for this type of industry. Most of the high level universities are located in areas such as Mexico City, Monterrey, Guadalajara, and Puebla. Therefore, the avoidance of turnover in the maquila technical staff is an important issue, at least until education facilities emerge along the Mexican border. The border region is one of the most rustic areas in which to live in Mexico. This is one of the possible factors for why the turnover of technical personnel can be constant.

The maquila companies cannot control the external environment or the development of the cities; therefore, they must motivate their staff with their available tools. Such tools are training, competitive wages and bonuses. One of the questions studied in this thesis is how the companies can determine what motivating techniques will improve the performance of staff, either professional or low-level staff. Many of these techniques of motivation are largely influenced by the cultural background of the managers. It cannot be stated that motivation techniques established by Mexican managers will produce an improved performance of the staff; in this process, culture plays a primary role. The author's personal experience gives credence to the importance of culture in the motivational process. When working with a foreign manager, a native from an Asian country, the manager stated perceptions that Mexican staffs exhibit a lazy behavior; the reason for this expression is the lack of staff interest in working overtime. Obviously, the manager was accustomed to Asian staff who would continue working

after hours even when it is not really necessary. This type of behavior is a custom more than a real need. From personal interviews with Asian technical staff, it can be said that most of the people work more hours than required because they learn this from their work partners. In Asian companies, the sense of belonging to the company as a part of a large family responds more to a paternalistic behavior than to an economic need. The managers suffer in that situation from a culture shock. Their idea of how a subordinate must behave is changed radically; and in this case, they have two options: to adapt to the Mexican culture or to change it. The second option does not work after several attempts; therefore, the first option is more acceptable. When a manager needs someone to work overtime, he must ask the employee and pay for that overtime or offer compensation time.

Even though Mexican laborers have a tendency to show a paternalistic behavior, they also can easily switch from one company to another without feelings of remorse. This is easily seen in the maquila environment. According to Williams and Passé-Smith [10], the lack of workers in the maquila area promotes this type of behavior. Turnover is probably a major problem in the maquila industry, and this is a human resource factor. There are other problems such as currency change, maquila rules, and NAFTA issues. One of the statements proposed in this thesis is that culture has a primary influence on the turnover rate, not because of the nationality, but because of the management techniques implemented in the maquila facilities. The contradicting expectations from the Mexican staff and from foreign managers and administrators could produce friction among staff and management that could lead to high turnover rates or lack of commitment with the company from the Mexican staff. A fishbone diagram depicting some of the possible





### 1.2.3 The turnover problem in the maquila.

The turnover data gathered by Williams and Passé-Smith [10] reflects a lack of commitment from the workers through the maquila industries; these data reflect the point of view of the low-level workers, but many of the causes found in this study can be extrapolated from the cultural dimensions that were analyzed while researching this thesis. Among the causes that Williams and Passé-Smith [10] mention in their research are the following:

- Work monotony
- Poor wages
- Higher demand for workers than supply
- Poor cities infrastructure
- Immigration to U.S.

Most possible causes were found in surveys given to workers questioning their reason why they left or may leave the maquila company. In the case of the non-professional staff, the reason according to Williams and Passé-Smith [10] for high turnover is “too many jobs chasing too few workers.” Statistics show turnover rates from 7.6 % monthly to 8.7% at the maquildora industry in Ciudad Juarez. Thus, motivation plays a main role in maintaining the staff in the maquila. Here is where the management culture will affect the workers’ perceptions of the companies’ intentions to improve the quality of life for the average worker.

Cultural differences are not the only reason for high turnover; there are many other issues that promote high turnover, but understanding the culture of the Mexican worker

will lead to a better motivation proposal based on his internal expectations. If too much competition for labor is present, the optimal task for prospering in the maquila environment is to reduce turnover rates and increment the productivity. This can be done by understanding the needs of the Mexican personnel involved in the maquila. Taking advantage of the low wage levels of the Mexican manpower will produce only an exploitation system that will lack manpower. Manpower, when it is pushed by the economic needs, will tend to switch to those companies that offer the best benefits according to its perception of what is good for the employee's needs.

On the other hand, the motivation factors of professional staff are different. Most of the technical staff will possess some level of training. According to Diaz and Lorand [5], one of the main Mexican perceptions connected to education is the opportunity to progress; meanwhile, to American students, education is related to being productive and happy. Turnover problems and high educational levels are different from the technical staff perception. According to Kerr and Rosenbaum (Babcock [3]), there are some particular characteristics of the technical professionals that distinguish them from scientists.

- High need for achievement
- Desiring autonomy
- Identify itself with their profession
- Maintain their expertise

These characteristics offer a general profile of the technical professional, with the comparison made to scientists; they give a good idea of what kind of factors motivate a

professional. Kerr and Rosenbaum (Babcock [3]) developed their observations in the United States; therefore, this research must acknowledge an influence from their formal culture (North America). One of the discoveries made when this thesis was developed is that when the educational level increases, the cultural differences decrease with some foreign cultures; this factor will be discussed in other chapters.

### 1.3 Research Objectives

This research follows several objectives, and the main objective is to establish a method to estimate the affinity between two cultures within the maquila environment. The reason to follow this objective resides in the fact that initially this thesis originated out of the need to establish what the effects of culture and practices are on the maquila industry. Apparently, culture is largely related to the turnover and some other negative behaviors in the maquila environment. Some authors consider that the cultural background of these techniques influences motivation techniques. Therefore, one of the guidelines for this thesis is that even though humans have similar goals in life, the way of reaching their goals is influenced by their native culture. This thesis evaluates mathematical methods to measure subjective factors, such as wage perception and perception of manager policies. All these factors generate the sparks that motivate a person to do his best in daily tasks. Other factors such as personal relationships, political events, economical crisis, war, and natural catastrophes also influence the performance of any person in his daily tasks, but we must consider these factors as noise or those factors that cannot be controlled by the manager or company manager.

On the other hand, factors such as workplace physical environment, wage perception, security and health services and relationship with managers must be controlled by the managers to get the better performance of their staff, but this study can question which factor will have the most importance on the satisfaction of employees. How this human resource can be motivated to improve employee performance to a point of almost perfection is one of the questions posed in this thesis. It can be stated that almost any process in the world can be measured, i.e. from birth rates to average number of words in a book. However, what about motivational factors; are these factors measurable? Is the measure of these types of factors reliable?

Motivation factors can be analyzed with tools such a Cpk for a particular process. Several studies have been made about culture and its effects (Whitehall , Yoshino and Ewing (Ewing [4])) on the performance of companies with various cultures involved in the production process, but none of these made a clear relationship between motivation techniques, expected results, and its relationship with the cultural background. The measuring methods for motivation of foreign staff will be detailed in the methodology and analysis chapters of this thesis.

Other objectives of this thesis are to establish an analysis about the influence of the language in the transmission of cultural behavior in a society. Even though the language factor is closely related to anthropological issues more than motivational, the intention of this issue is to establish the relationship between language and culture. The purpose for this thesis is also to establish a method to estimate what is the grade of satisfaction and unhappiness and define motivation in terms of quality control methods. Because controlling the performance of human resources is easier to increase the quality

of the overall process, this research supports the statement that different cultures can be categorized in order to determine which cultures will be more able to coexist because of their similarities as cultures. On the other hand, when there is a high level of discrepancy among cultures, the possibility of a cultural shock between those cultures that interact under high inequalities basis increase. But how can one state which factors determine what makes one culture different from another? At first hand, it can be estimated that superficial traditions and behaviors help to distinguish cultural group from another. One of the goals of this thesis is to establish a method to measure such factors that determine the group behavior, and how this can affect the intercultural relationship in a maquila environment.

## CHAPTER 2

### LITERATURE SURVEY

The objective of this chapter is to show the information used as background to support the statements made in the thesis. The chapter is divided into a literature review section and a section that refers to the background about culture and language influence in the *human motivation and its relation with the maquila environment*.

#### 2.1 Literature review on motivation and culture.

Motivational theories can be classified in two categories: content theories and process theories. The content theories establish that people are motivated basically by unconscious human needs; on the other hand, the process theories state that persons will behave in a particular way, expecting a reward. Figure 2.1 shows how the content theories are similar. Herzberg (Babcock [3]) and Maslow [1] classify the motivators in groups. Some similarity is shown by Maslow [1] and Herzberg (Babcock [3]) when they consider that some basic needs, such as food and shelter, should be fulfilled in order to develop the desire for higher level needs, such as recognition and achievement. Hofstede [2] considers that other factors, such as culture and practices, have a large influence on a person's daily behavior. Thus, Hofstede considers that individual "mental programming," or values and practices learned at early ages, could explain a person's behavior and practices. The main source for human behavior comes from the person's culture.

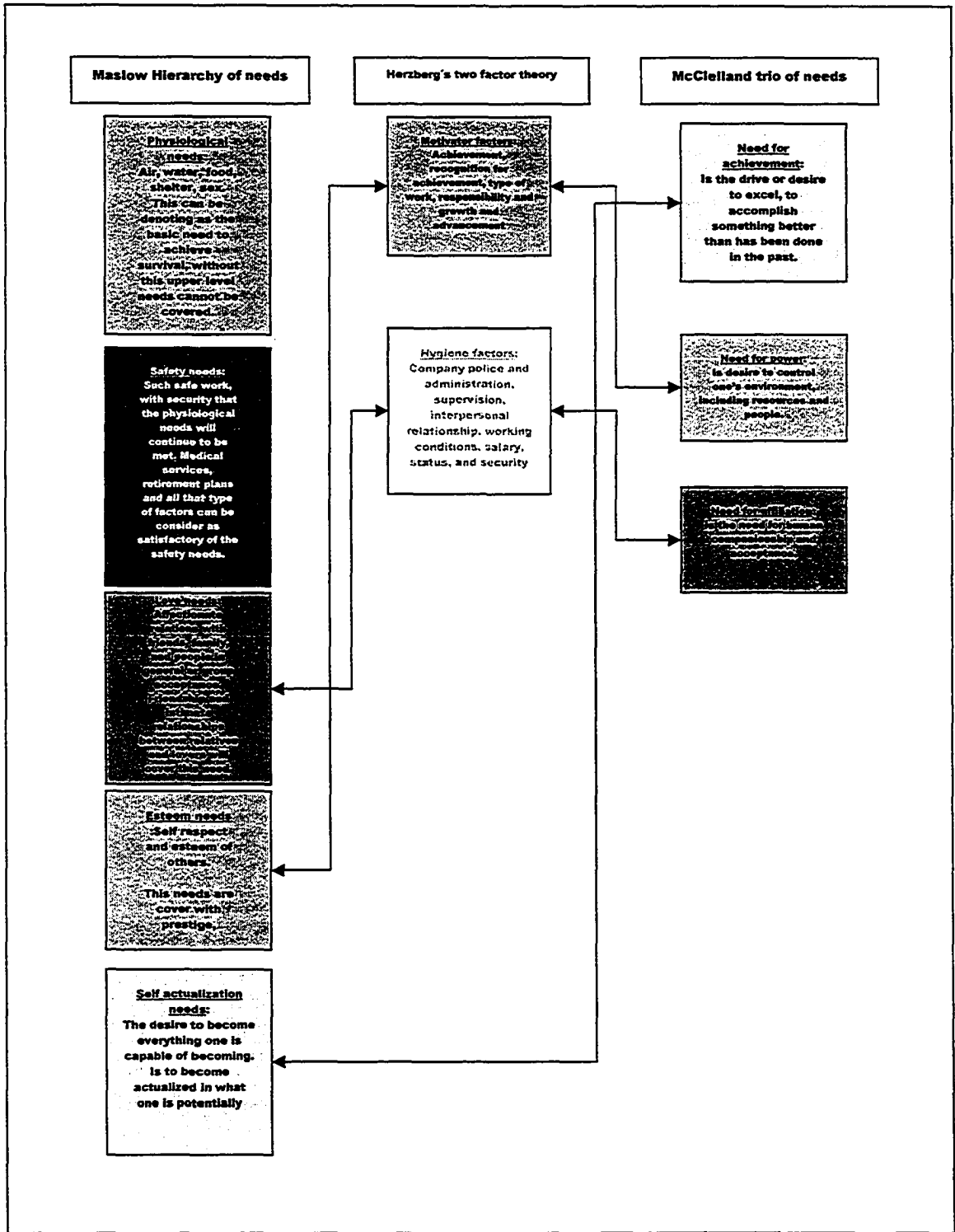


Fig. 2.1 Motivation theories similarities

In the Adigun and Stephenson [11] study, British individuals fit better with Herzberg's (Babcock [3]) job satisfaction theory than Nigerian employees performing similar activities; researchers of motivation theory show the same trend. The expectancy theory developed by Petri (Babcock [3]) indicates that a person's actions are driven by the expected results that their behaviors will produce, and that the results will drive to the desired outcomes or rewards. Petroni [12] focuses on particular factors that can motivate professional staff. Motivation factors can grant information to develop a predictive method to understand the reasons that motivate a person to perform a task. Petroni [12] considers that most of the time the engineering staff is underestimated and therefore lacks the motivational factors that will improve their performance. This study was developed in several companies with transnational presence.

Motivation is not only the result of the income level and type of work developed. Other factors, such as cultural values and practices, can affect the perception of the individuals in an unconscious manner. Human groups can be classified according to several categories, such as nationality, sex, age, and educational level. Petroni, [12] in his study of engineers' management practices, mentions that managers fail to recognize the motivators of professional staff; thus, he considers the needs differently, according to the education level. Peter and Stephen [6] discuss the motivations of a contingent worker versus a permanent worker and notes that some differences were found. High motivation levels were found in contingent workers, but the study does not indicate the sources of this higher motivation. This specific study is difficult to extrapolate and apply to other areas where permanent workers are the common rule; besides, many researchers indicate that job safety is not a dispiriting factor but monotony can be (a dispiriting factor).



From the research studies, the survey techniques recommended by Clover and Balsley can be mentioned [15]. Clover and Balsley based their methodology on the goal of finding the motivational behavior source. Other research available about motivation was developed by Bent and Seamen [14] and pertained to small food processing factories; here the reasons of dissatisfaction and motivation were analyzed from the employees and managers' points of view. Great differences about the perception of the motivation and dissatisfaction factors were found. The problem with these types of surveys is that they reflect the expectations of the employees, even though in reality employees will not do what they wish, but what they feel is more convenient to request (in a survey) at the moment. For example, employees can mention increase of wage as a motivational factor, but when training and better facilities are offered instead of money increase, motivation could show an increase since these results can be taken only as a reference of the expectations for different cultures in this type of study. This effect was mentioned by Hofstede [2] in his research revealing that any type of pencil and paper survey would reflect the desires of the respondent, not his actions when the options are offered. However, even this information gives us a trend about how human groups perceive their environment.

#### 2.1.1 Literature review on culture influence

Some researchers, like Huddleston and Good [16], consider that North American motivation theories reflect their native culture influence; therefore, dealing with motivational factors without considering native culture and practices on cross cultural activities is not an uncommon practice. This thinking could lead to wrong decisions

because what can be a strong motivator for a particular culture can be a trivial factor for another culture.

Social theories that correct for the American profile do not necessarily match social profiles for other cultures. Whitehall (Ewing, Meissner [4]) describes some cultural differences between Japanese workers and American managers, and how they must learn to adapt to different ways of perceiving authority, work relationship, wage level, as well as compromise between company and employee. Whitehall (Ewing, Meissner [4]) focuses his analysis of the Japanese worker on the postulate that culture has a direct impact on the behavior of the employees in daily tasks. The personality of the Japanese worker is partially responsible for the success of Japan. The personality of the worker and the administration's fulfillment of the employee's needs play an important role in the success of Japanese private companies.

Whitehall's (Ewing, Meissner [4]) research results are based on data gathered from several Japanese companies. These results show some important differences between the Japanese workers interviewed and American workers performing similar activities. Some of the motivation factors found in the Japanese workers' cultural behaviors were lifetime job expectation, loyalty to the company, identification with company, and wages based on specific needs. One expectation of many Japanese workers is the application of a paternalistic reward system by the managers; therefore, Japanese workers consider that management's responsibility is to provide social security and even a new position in the company if the actual one is no longer needed. The Japanese worker will be loyal to the company for a lifetime. Normally, he will identify himself as a company family member instead of a member of a company. North American workers'

behaviors are different. More individualism is shown in the average American worker, even if there are labor unions, switching from one company to another because benefits are better is not unusual. Both Japanese and American social systems already have proven to be successful, and both nations show a stable growing economy, but cultural practices reflect deep differences.

The management plays an important role when fulfilling particular staff needs. In the study developed by Whitehall (Ewing, Meissner [4]), the information indicates that North American system's rewards policies could not achieve the same goals as achieved by the traditional Japanese system. The basic difference is that the American traditional reward system is awarding personal effort and performance that can be reflected in monetary income to the company; meanwhile, the Japanese reward system is based on paternalistic rewards. The American workers normally expect to be rewarded because of personal skills and performance in the company. On the other hand, the Japanese workers expect a reward because they are loyal to the company, and identify with the company. In addition, Japanese workers will accept those rewards that cover personal needs, such as family housing. Based on these studies, it can be affirmed that culture plays an important role in the motivation of human resources; therefore, it can be stated that cultural values do affect the behavior of workers. The observations made by Whitehall (Ewing, Meissner [4]) can be corroborated with the study developed by Yoshino and Ewing (Ewing, Meissner [4]). In this study, Yoshino and Ewing describe the potential problems when foreign companies established western reward policies in Japan. The Huddleston and Good [16] study about motivational factors of Russian and Polish retail salesmen shows

that even in close proximity, cultural groups have important differences in motivational factors.

Management by objectives [MBO] is a good example of how a native culture had influence on a management theory. MBO states that rewards offered by the manager will be strongly influenced by the ability of the individual to achieve goals agreed upon with the manager in a period of time. As can be noted, this management theory is highly individualistic. In those social groups where the group's well-being is primary, this type of management will obtain exactly the opposite expected results. Drucker, the author of MBO, (Babcock [3]) is an American native. According to Hofstede [2], the United States is one of the cultures with the highest individualism level. North American society shows deep differences if it is compared to Latin American or Asian societies.

Even considering the previous statements, American originated cross-culture motivational theories are among the most important, and the main reason for this is the United States' extensive economic activity. The development and implementation of overseas facilities by American companies provide the opportunity to gain experience about the issue. Adigun and Stephenson [18] coincide with Hofstede's observations when members of several cultures were compared. One of the most interesting research developments is the cultural analysis made by Geert Hofstede [2]. Hofstede performed research, which included a survey of a transnational company with headquarters located in the United States. With the results of this survey, Hofstede [2] developed a classification of the unconscious mental programming of each of the analyzed cultures. With this classification, Hofstede [2] extrapolates the results to explain some effects when cultures coexist in a daily relationship. Hofstede [2] describes some reasons of

cultural shock and the potential perks and drawbacks based on the cultural legacy of each person. After analyzing the maquila environment, it can be stated that many, if not all, of the conflicts between managers and staff are the product of the ignorance of how to deal with a foreign person.

Even though the basic needs of humans are similar, other needs are shaped by the environment. One's surrounding culture influences the perception of how success or defeat is perceived and the means that lead to it. With the introduction of a method to measure the culture and compare these results to classifications as the one development by Hofstede [2], one can estimate how well or how bad the company satisfies the needs of a cultural group. The drawback in the Hofstede study is the lack of technical tools to prove his point, i.e. statistics.

### 2.1.2 The cultural dimensions definition and function measuring culture

Culture is defined [19] as, "the group of social structures, religious, intellectual and artistic, that characterize a particular society." In another definition, culture is defined as "customs or achievements of a particular civilization or group." For both descriptions, culture refers to behaviors and customs that differentiate one social group from another, not considering ethnicity or nationality, but behaviors. But how is this behavior learned? Drawing from personal analysis, culture is learned from one's home and from the daily interaction with the members of that particular society. According to Nelson [30] the process of learning how to think rationally takes several years to develop, and the skills necessary to make and use tools do not develop naturally but must be learned. In order

for the species to survive, humans have had to form relatively stable social groups to protect and instruct their young until they were able to survive on their own. But the tools that human groups need in order to survive are not simply things like hammers, needles, spears, baskets, knives, grinders, and bows and arrows. The group needs some common understandings in order to live together peaceably and to cooperate. It needs a sense of identity and some picture of the universe such that its members can see a similar pattern in the world about them. In this sense, calendars by which one can anticipate the changes of seasons, a way of counting so that one can estimate and compare quantities, a system of belief about the forces that control the world and how one can influence those forces, and a common realization of the needs and goals that bind the group are all tools that are important to humans. These sorts of tools take various forms such as *magic*, *folklore*, and *religion*, and are among the most important class of tools that human beings have at their disposal. The human young have to learn these tools also. The task of learning all of this takes a considerable length of time, but it would take even longer without the most important tool that humans have developed, the power of *communication*. But communication itself must be learned.

The language is the main medium to communicate culture to the newest members of a society. One of the analyses developed in this thesis makes comparisons between countries that were considered as potential and main economic partners of the Mexican society. This comparison was developed in order to define which cultures are more likely to adapt to the Mexican culture, and which show deeper differences with the Mexican people. According to several anthropologists and sociologists, trying to do this is like comparing apples with oranges. Hofstede [35], Georgas and Berry [20] developed

separate studies to determine what are called dimensions, or those social, ecological, economic, or physiological factors that differentiate one culture from another. Georgas and Berry [20] analyzed seventy-seven factors from statistical books; from these factors, twenty-five clusters were used to compare several nations. The analyses made by Georgas and Berry [20] compare many factors. Based on their findings, nations were clustered in the following factors:

- Ecology factors: highest monthly temperature, highest monthly level of precipitation
- Education: total adult illiteracy, percentage of gross national product, enrollment ratios in third level education
- Mass communications: telephones, radios, number of newspapers
- Population: infant mortality, rate of population increase
- Religion: percentage of population declaring religious sect

These ecological and social factors demonstrate differences among nations, but this study only classifies the ecological and social factors, and the researchers did not explain why these factors are different. Ecological factors such as ground available, sources of water and rain precipitation levels are merely random facts. For example, the location where the Mexican capital was established is based on a legend. Since Georgas and Berry [20] designed their study to analyze environmental factors but not social factors, the study lacks analysis about behaviors, traditions or values that may be the cause of differences from one society to another. Hofstede's [2] approach to compare cultures is more precise because he tries to define what behavior and ideas differentiate one culture from another. People create culture; while environmental factors have influence, they do not reflect

culture. Cultural differences in the workplace can be difficult to analyze, and it is most difficult when there is a marked difference in personal needs and value systems.

Although there is an overlap in the nature of needs, differences may produce friction and unacceptable results, such as lower motivation and productivity. This is one of the reasons why managers struggle with personnel management problems in overseas factories because they try to evaluate the performance of their technical staff based on their native cultural values. In the maquila, most of the time, management is formed by foreign personnel that are strongly influenced by their native culture. Normally, foreign companies will try to establish their management style rather than adapt it to the new culture to manage.

For human societies around the globe, their first biological objective is to survive the environment. This biological need promotes behaviors that influence the creation of social characteristics; moreover, cultural isolation makes human groups evolve in different ways. These different social patterns were promoted in ancient times because of the difficulty to communicate with communities located large distances apart. Isolation causes communities to develop in different ways. For example, a language undergoes different interpretations when moving from one country to another; a single word meaning can lead to discussions or legal considerations. On the other hand, nationality is not a characteristic that can describe how a person behaves in his/her daily relationships with other members of a community, such as work partners, neighbors, relatives, and associates.

The nationality characteristic could not be used to prejudge a person because a single country could embrace several cultural groups. An example of this is Mexico,



where a large portion of the society is made up of members of industrialized cities and another big portion of the population is native people that still practice pre-Hispanic traditions. Even though the two groups share common behaviors, such as religious preferences, the behavior could differ because of the physical changes, such as crowded houses. This crowded shelter style (i.e. Mexico City) leads to small family sizes. On the other hand, countryside societies tend to produce larger families for several reasons. Some of these reasons are the opposite of the characteristics of a city family, such as availability of living space and need for extra help on a farm because much of the work still requires manual labor.

In Mexico, the behavior shown between southern communities and northern communities differs, even though these communities share the same nationality. These behavioral differences lead to conflicts when people belonging to different communities must interact with each other. One recent and sad example is the disintegration of former Yugoslavia. Here, communities that shared land for several centuries became involved in a genocidal war because of cultural and religious differences and a wrong understanding of nationalism. This is a clear example that native nationality does not mean that somebody should be stereotyped for a particular behavior; cultural differences will exist among the members of a nation, unless those values and behaviors are widespread among the members of a society. In order to achieve this constant interaction, communication must exist among the members of a nation.

On the northern border of Mexico, a large proportion of the population is recent emigrants from different parts of Mexico. Partially, this emigration process was promoted by the maquila program, creating several problems related to this new social diversity.

On the other hand, the immigration process promoted the integration or homogenization of culture because this allowed the interaction of several cultures with the locals. There are physiological, social and economical differences among the members of a cultural group, but from the president of a nation to the poorest member of a society, they share cultural behaviors unconsciously. This unconscious behavior begins at a very early age. Therefore, traveling or living in a country different from the native country does not have a significant influence if it is not done at an early age.

One of the possible effects of “mental programming” at the maquila is a high rate of turnover and lack of motivation. Turnover has an extremely negative effect on any productive organization. Motivation is a subjective factor or, in other words, is the result of other physical, physiological and subjective factors that range from leading techniques to wage level. The management controls many of these motivational factors. For instance, the relationship with the authority, the income level, the physical work conditions and other factors are under control of the management. According to Geert Hofstede [2], there are four factors that can describe the cultural profile of a group. Symbols, heroes, rituals and values factors give shape to the behavior of individuals, or in other words, determine their social programming. Social patterns are learned during the early childhood, and they are deeply established at a young age. This is one of the reasons why sometimes adaptation to other cultures is so hard to achieve. This lack of adaptation increases when a foreign culture differs too much from the native culture.

Culture can be manifested at several levels as Hofstede [2] notes in his study. The first factor that illustrates the differences between one culture and another is the symbols, which consist of those more superficial particularities of each culture. To this

manifestation belong symbols, such as dress styles, and particular words or meaning of these. Symbols can change easily, almost from one generation to the next; therefore, symbols can be considered as the weakest cultural characteristic.

The second factor mentioned by Hofstede [2] to determine a cultural profile is the heroes. Heroes are those real persons or unreal characters who possess or characterize behaviors that are appreciated in a particular culture. In the United States, some heroes such as George Washington, Benjamin Franklin, and more recently the sport champions like Michael Jordan, have become the most admired heroes of this society. In Mexico, as in many countries, many of the heroic figures are promoted by the state in their educational programs. This promotion is the result of years of influence from state education; the heroes' behaviors become the most desired characteristics, but they do not need to be real. Many practices in Mexico, such as bribes and corruption, are contrary to those things that are taught by the states and the society itself. Heroes indicate who belongs to a particular society, but it is not common behavior of a society. Heroes only represent what is desirable in general by a particular society, but those characteristics are not necessarily practiced by the society. The importance of this factor is that heroes are a simple way of separating good from evil.

The third factor of importance, according to Hofstede [2], is the rituals. Rituals are those social interactions that are often superfluous. Some activities considered within this category are activities such as religious ceremonies and state celebrations, such as Independence Day, Mother's Day, or political public meetings. All these rituals are not essential to achieve some goals; instead, they give shape in a deeper manner to a society

by integrating the members of a particular society. In other words, they promote individual nationalism.

The first three factors are superficial, and they are no more than social practices. The real factors that determine the profile of a society are the values and practices. According to Hofstede [2], the values are well-shaped at the age of 10. Values are our perceptions of intangible realities, such as what is good and what is evil, dirty vs. clean, logical vs. illogical, normal vs. abnormal. These four dimensions are based on the study made by Alex Inkeles and Daniel Levison [22]. They state that survival factors are different among societies. The factors that Inkeles and Levison [22] determine as crucial in understanding how a society works are the following:

1. Relation to authority
2. Conception of self, in particular
  - a. the relationship between individual and society, and
  - b. the individual concept of masculinity and femininity
3. Ways of dealing with conflicts, including the control of aggression and expression of feelings (Inkeles and Levison [22]).

These factors were considered dimensions to measure. These were used to determine the relative differences among cultures; these dimensions do not indicate what the best or worst culture is, but they indicate what factors are important to define a cultural profile. Nationality, as mentioned before, is not a characteristic that can define a person's behavior in his/her daily relationship with other members of a community, such as work partners, neighbors, relatives, and associates. Cultural dimensions will be the

“rule” to measure the differences among cultures, thus determining with these results which cultures are more likely to coexist without the risk of suffering a cultural shock.

In a 1991 study by Hofstede [2], he learns about the effects of culture on work performance. This is a complete study developed to understand the cultural differences among countries, and how they affect some aspects of organizations. The survey is based on three main factors that mark the differences among cultures. These are in relation to authority, masculinity and femininity values, and the way of dealing with dilemmas. The study was conducted inside IBM Company in its facilities throughout the world in more than 50 countries using similar staff levels. Hofstede [2] found four factors in which managers and employees differ according to their motherland culture. These factors are power distance, dislike for uncertainty, individualism vs. collectivism, and masculinity vs. femininity, which are similar to those found by Inkeles and Levison [22].

In the case of the Latin American culture, the findings were as follows:

- **Power distance:** In this factor the Latin American countries hit high, which means that these countries more easily accept large (many subordinates) domination from a manager.
- **Uncertainty Avoidance:** This issue relates to how a community or its members deal with situations where they do not have enough information, and how they deal with these situations. (For example trying to avoid it in advance). For this factor, Mexico rated 33 (in a 1 to 50 rank, with 50 as the highest rank) in the Hofstede [2] study, which is a relatively high rank. So in this culture, the members try to avoid uncertain situations more often than other cultures do.

- **Individualism vs. collectivism:** This denotes the level of cooperation among the members of a given society. In general, the reference denotes that in poor countries, collectivism is high; on the other hand, rich countries score high in individualism. For this factor, Mexico scored 20 (in a 1 to 50 rank, with 50 as the highest rank), which is a relatively low score, so Mexico can be considered a collective society.
- **Masculinity vs. Femininity:** This factor denotes which issues are important to each society to determine the personal success; the masculine cultures encourage the success in terms of money, and achievement and recognition. On the other hand, feminist (with high feminine values) societies encourage more quality of life and social success as a group.

According to Hofstede [2] foreign managers located in Latin American countries, such as Mexico, Argentina, or Colombia, must try to motivate their staff by giving to their staff more economic support and a stable job or work source. Hofstede [2] does not mention giving Latin American employees training; however, it can be extrapolated that for a Mexican technical staff, the more he knows the higher is the possibility of finding a well-rewarded and stable job. Other countries' profiles presented in this paper are the United States, Korea, Japan, and Germany. Hofstede [2] suggests that the United States has a highly competitive culture. On the other hand, the Korean culture tends to be a more cooperative, group society. The cultural diversity can be a benefit or a drawback. This will depend on whether or not the managerial committee endorses the positive factors of the culture, and restrains those behaviors that can be considered as negative to

the performance of the company. In order to implement a behavioral change, several leading techniques can be used. The basic problem with the reward and punishment system is the different cultural values among the nations.

### 2.1.3 The language as an instrument for culture transmission.

Culture is learned from parents and elders. They teach it to the youngest members of a society. Research indicates that language is the main culture transmitter. By imitating sounds of adults, infants learn verbal communication in the early ages. Initially, many words are meaningless for children; understanding the significance of words is a subsequent activity. Therefore, one can state that understanding the words is not genetically engraved on individuals. Only biological programming is established at birth. A baby can suck from her mother's breast, but nobody teaches her how to do it; then, sucking is a "biological ability." Speaking is learned from elder family members; then, speaking is a "learned ability." Concepts such as good, evil, fair and unfair are learned in similar way. Humans in adulthood can develop a personal conception of the world, but activities learned at early ages will have an influence for a lifetime. Isolating human groups allows them to develop unique methods of solving problems; consequently, these solutions are only influenced by members of that human group.

Medieval society is an example of how isolation and language affect cultural diversity. The Medieval Age was the basis of contemporary Europe. The English and Spanish cultures were born in the Medieval Age, and two cultures descending from the English and Spanish cultures are implicated in the maquila environment; one is Mexico,

receiving a strong cultural influence from Spain for three hundred years, and the second is the United States as a colony of England.

#### 2.1.4 The European cultures development influences the modern culture.

Human groups that originated from Central Asia (Trans-Caucasus in modern Armenia) colonized Europe first. Probably, European languages have a common origin, which is the Proto-Indo-European dialect (Gamkrelidze, Ivanov [23]). Some languages derived from Proto-Indo-European dialect are modern English, French, German, Italian, and Spanish. Other languages are derived from the Proto-Indo-European language. Since the sixteenth century, Europeans noticed a relationship in dialects such as Italic, Celtic, Germanic, and Slavic. The variations of dialect sounds occur along centuries or even millenniums. Emigration, intercultural relationship, wars, and isolation are factors that possibly led to the origin of language diversification. Language is a “learned ability”; therefore, transmitting culture and behaviors is done with language, oral, written and nowadays electronic. When a human group cannot understand other language interpretations, it is almost impossible for traditions and knowledge to pass from one human group to another. If records exist but nobody knows how to decode that language’s symbols, i.e. the Ancient Maya and Egyptian manuscripts, understanding that culture becomes impossible.

When the Roman Empire’s armies reached the cultures from their western border, Roman legions attempted to conquer most of these “barbarian” cultures, such as Franks, Bretons, Celts, and Flemish, but most of them kept independent from the Roman



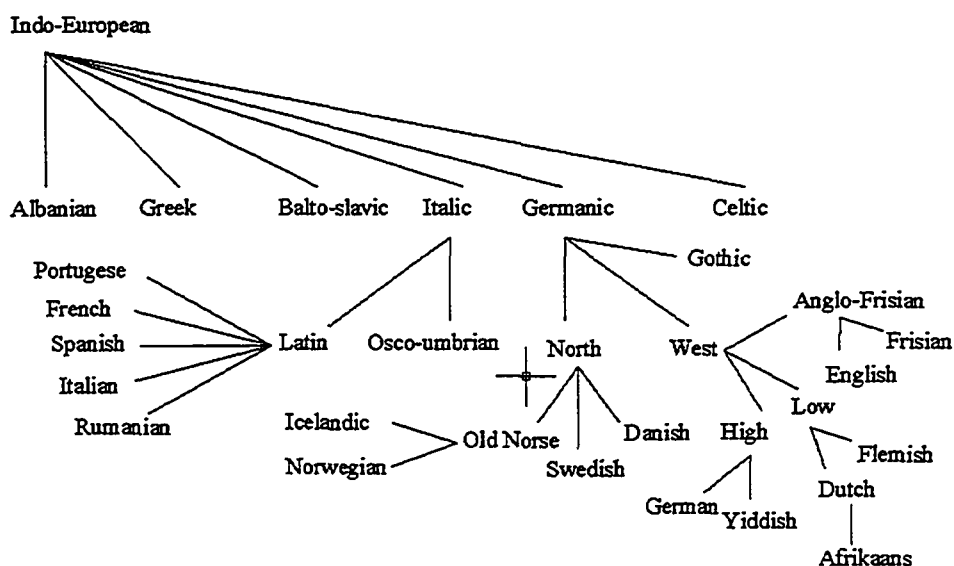


Fig. 2.2 Root languages in modern Europe

Empire. The barbarians started to trade with the Romans and trading benefited the Romans; peace was achieved with no need of military actions. “Mongols” invaded Northern Europe; as a result, the “barbarian” cultures were forced to move towards Southern Europe. Decay and weakening of the Roman republic and institutions allowed for the fall of the empire after the “Justinian” period because of the barbarian invasions. Lack of maintenance of the Roman institutions, such as civitas, senate, tax poll, communications building, roads and harbors led to the proliferation of local rulers; thus, the centralized Roman social system disappeared. The new local rulers managed to monopolize large extensions of land, renting it to pedestrians in exchange for protection. This originated the economic system known as “Feudalism.” The Catholic Church promoted this new type of organization because many of the Church leaders were also landowners. The Church lands were obtained as charity, legacy, or simply taken by force

from pedestrians or other rulers. Lacking an empire center reduced communications during feudalism. Lacking the protection of the Roman fleets, armies caused harbors to be abandoned and pirates and Muslim vessels attacked vessels on the open sea. The isolation of European societies led to the formation of modern languages. Before the Roman Empire fell, a mix of Latin and native dialects was the ordinary way of communication among the members of the Roman Empire. Without the Roman Empire, sharing information became difficult to medieval societies (Nelson [21]).

Each society developed concepts of how to survive, what practices should be promoted, how to live their religion, and how to organize. In addition to the influence of the Catholic Church on the Medieval Europe, the Lords had more influence on the formation of societies and cultural behaviors than the church. In figure A.1 through A.6 (in the appendix A), the dispersion of modern nations and their relationship with their languages roots is shown. The feudal states evolved until they became the basis of the modern European states. The original Feudal states swallowed smaller counties; geographical isolation also helped the creation of new nationalities, i.e. the United Kingdoms in Europe, the United States in North America, and Japan in Asia. The conquering of America by the Spanish and the posterior Colonization period increased differences among European societies.

Upon the creation of national banners, formal armies, national festivities, and national anthems, nationalism was promoted in the European states. Starting in the fifteenth century, these new European states began to expand, dividing Africa, Asia and America into colonies. The colonialism effect was the destruction, ban, absorption and crossbreeding of native societies in Africa and America. Normally, when colonialist

nations attempted to impose their language, the native cultures were almost extinguished or segregated. Many native societies of America were diminished almost to extinction (Apaches, Navajos, Aztecs, Mayas, Incas.). Traditions were destroyed or evolved, adapted and mixed with the European culture. Therefore, the creation of modern nations and colonialism helped to increase the differences among the members of European cultures; furthermore, these nations gave birth to new nations in the colonized territories.

## *2.2 Mathematical models for culture and motivation measuring*

Developing of mathematical models to measure differences of culture groups is limited nowadays. Schmitt and White [31] developed a correlation methodology to determine the influence between job motivation variables and the interest of the individuals. Wanous and Zwany [32] developed a correlation method to measure satisfaction factors and importance of the factors. The factors were based on the Aldefer EGR hierarchy theory. Shoura and Singh [33] developed a survey based on Maslow's hierarchy of needs. A quality index equation developed by Shoura and Singh was used with the data. The equation shows the ratio between the score indicated by the respondent for each question's cluster. The clusters were determined based on the Maslow's hierarchy of needs.

Evaluating motivation with numerical methods is hard because surveys require a large amount of time and cooperation from organizations and individuals. This increases the difficulty of this type of study. Information about motivation through cross-cultural

environments is also limited, thus giving opportunity to develop evaluation methods of motivational and cultural effects in the maquila environment.

### 2.3 Summary of chapter two.

Nationalism in the 19<sup>th</sup> and 20<sup>th</sup> centuries, besides the creation of modern states, encouraged differences among cultural groups. Conquest of America by Spanish and English people and the destruction of native cultures created more new nations and cultural behaviors. In Asia, the opening of China and Japan to the western world, also promoted the creation of new nations; these new nations were not fully known before the 19<sup>th</sup> century. The modern nations and nationalism increased the gap among the cultures. National anthems, national heroes, civil wars and local rules made deeper differences between one culture and another. Normally in this process, the political, economic and military strong groups established themselves as the norm in each country. Nowadays, the Internet, TV, movies and literature play an important process in eliminating and/or reducing cultural differences. Powerful nations such as the United States, Japan, and some European countries are communicating and imposing behaviors on those countries that share economic ties with them. Migration from poor nations to richer ones also plays a strong function in the elimination of cultural differences in modern nations.

Unfortunately, some of these modern behaviors are not positive, or are extremely different from those of the poor countries. Conflicts in the Middle East are a good example of the resistance of Muslim nations to adapting to western behaviors. Even within the modern nations, resistance to the globalization of economic and social

behaviors exists; this is important for this thesis because this study considers that behaviors adapt themselves to the circumstances of the moment. The survival of some pre-Hispanic traditions in Mexico and Peru were achieved because these were adapted to as the dominant culture. Traditional medicine and some festivities are based on pre-Hispanic traditions. Therefore, the cultural behaviors can evolve in short or long periods of time, depending on the actual context. The validity of the results of this thesis can be considered only if events remain stable for a period of time. Wars, economic or environmental crises may change the behaviors of a cultural group; therefore, before a cross-cultural facility is developed, a cultural study is recommended.

CHAPTER 3  
LANGUAGE AND MOTIVATION, AN ANALISYS IN THE MAQUILA  
ENVIROMENT

In the following pages, a graphical and statistical analysis of the data found by Geert Hofstede in his study is presented in order to determine the influence of languages on the cultural gap. Two methods were used. Analyzing graphical data was the first method. The second referred to a statistical analysis of the same data. The objective of these two analyses was to determine the language relationship with cultural diversity. One can estimate that cultures with similar language roots will present similar cultural values. On the other hand, cultures with deep language differences must show different cultural values. Finding cultures with different language structures and similar cultural values is considered a feasible outcome of these two analyses, which are a precedent for chapter four.

3.1 A graphical analysis of the language influence in culture.

In the previous chapter, Hofstede's approach to the cultural dimensions is described. In his study at the IBM Company, Hofstede [2] defines four cultural dimensions which he considered important to measure the difference between two cultural groups. The study was performed in 1980 and it included 50 nations. The basis of

the study was a survey which made inquiries of several social factors. Determining which factors may possibly affect the IBM employee's desires and practices was the main goal. In Hofstede's survey data, countries were ranked in four cultural dimensions. The employees ranking in the survey defined the average award to each country on a scale from 0 to 100. This study was selected as a platform for language analysis because of its broad extension of inclusion (80 countries worldwide and around 2000 surveys were applied).

Hofstede [2] indicated the influence of language in cultural behavior; nevertheless, his study did not analyze this influence with statistics or graphics. The goal of this section was to determine which countries showed more similarities while considering native language as the main reference. His findings indicate that cultural differences are greater among cultural groups with different language roots, and cultures sharing language roots have more possibilities of accepting one another.

This language effect in culture was detected in a maquila located in Reynosa, Mexico. In this maquila, the employees came from three different countries. United States citizens comprised a small percentage, less than 2%; Mexican laborers held the largest percentage, around 95% of the maquila staff; and finally, a group of Korean managers completed the employee composite with around 3 % of the staff. Some studies (Torres [25]) indicate that Mexican and Korean cultures share similar behaviors, i.e. paternalism, machismo, even though U.S. staff and Mexican laborers solve conflicts easily; however, between a Mexican staff and a Korean staff, conflicts were more difficult to solve.

The graphical analysis made considers 30 countries of the Hofstede study.

Table 3.1 shows some of results of the Hofstede [2] study. These countries were divided into six groups overall, according to their language roots. Latin countries were divided in three groups. The first group consisted of Latin nations from Central-America such as Mexico, Costa Rica, Panama, Salvador and Guatemala (see appendix figure A1). These countries were linked because the Spanish Conquerors created them.

Table 3.1 Hofstede scores for cultural dimensions, grouped by language root

Country	PDI score	IDV Score	MAS score	UNC score	CODE	LANGUAGE BRANCH
Mexico	81	80	69	82	MEX	LATIN/CEN
Costa Rica	35	15	21	86	COS	LATIN/CEN
Panama	95	11	44	86	PAN	LATIN/CEN
Salvador	66	19	40	94	SAL	LATIN/CEN
Guatemala	95	6	37	101	GUA	LATIN/CEN
Italy	50	76	70	75	ITA	LATIN/EUR
Spain	57	51	42	86	SPA	LATIN/EUR
France	68	71	43	86	FRA	LATIN/EUR
Belgium	65	75	54	94	BEL	LATIN/EUR
Portugal	61	27	31	104	POR	LATIN/EUR
Brazil	69	38	49	76	BRA	LATIN/SUD
Venezuela	81	12	73	76	VEN	LATIN/SUD
Colombia	67	13	64	80	COL	LATIN/SUD
Chile	63	23	28	86	CHI	LATIN/SUD
Argentina	49	46	56	86	ARG	LATIN/SUD
Denmark	18	74	16	23	DEN	
Sweden	31	71	5	29	SWE	
Norway	31	69	8	50	NOR	
Netherlands	38	80	14	53	NET	
Finland	33	63	26	59	FIN	
Singapore	74	20	48	8	SIN	ASIAN
Hong Kong	68	25	57	29	HON	ASIAN
Taiwan	58	17	45	69	TAW	ASIAN
South Korea	60	18	39	85	SKO	ASIAN
Japan	54	46	95	92	JAP	ASIAN
Great Britain	35	89	66	35	GBT	WESTERN GERMANIC
USA	40	91	62	46	USA	WESTERN GERMANIC
Canada	39	80	52	48	CAN	WESTERN GERMANIC
Germany FR	35	67	66	55	GER	WESTERN GERMANIC
Austria	11	55	79	70	AUS	WESTERN GERMANIC

Italy, Spain, France, Belgium and Portugal composed the second Latin group of countries. These countries were part of the Roman Empire (see appendix figure A.2); thus, they share Latin roots in their modern languages. The third group was formed with Brazil, Venezuela, Colombia, Chile and Argentina (see appendix A figure A.3). Another



group was formed with those countries with Western Germanic background which include Great Britain, U.S.A., Germany, Canada and Austria (see appendix A, figure A.4). Another group contains countries with a North Germanic language background such as Denmark, Sweden, Norway, Netherlands, and Finland (see appendix A, figure A.5) The last group was formed with five Asian countries sharing common language roots: Singapore, Hong Kong, Taiwan, South Korea and Japan (see appendix A figure A.6.)

For this analysis, these thirty countries were grouped according to the language root, physical closeness and common historical background. Testing was performed to determine the similarity or the differences among language branch groups. The tests were made using MINITAB  $\square$ . All the results gathered in the Hofstede [2] study referred to four cultural dimensions: Power Distance Index (PDI), Masculinity vs. Femininity Index (MAS), Individualism Index (IDV) and Uncertainty Avoidance Index (UNC). According to the results of the surveys, Hofstede [2] made a score that ranged from 0 to 100. The score assigned to each country did not indicate a quality level. The score only indicated the level of cultural value for each social group. In order to determine if the language branch has some influence on the cultural behavior and motivation, an ANOVA test was performed with the results from the Hofstede [2] study.

A Normality test was done for each cultural dimension data group by language root. Results are shown in table 3.2. Some of the data shows non-normality; these data are IDV from Latin Central-America countries, and Latin South America, and PDI from West Germanic countries. Even though some of the data analyzed did not show a normal distribution, the data were analyzed with one-way ANOVA using Minitab; the non-

normality was not considered as a controllable factor. The small sample size affects the results with some outlier or extreme data. During the test, the extreme data were not considered and were removed. The data from each dimension of the 30 countries were tested for normality with MINITAB™ again; these results are shown in table 3.2.

Table 3.2 Normality test results for the countries language groups

	P-value for Normality test of dimensions scores			
<b>Country Group</b>	<b>IDV</b>	<b>MAS</b>	<b>UNC</b>	<b>PDI</b>
Latin Central America	<u>0.014</u>	0.425	0.359	0.297
Latin Europe	0.139	0.592	0.663	0.843
North Germanic	.895	0.676	0.278	0.148
Asian	0.043	0.084	0.404	0.611
Latin Shout America	<u>0.039</u>	0.746	0.145	0.628
West Germanic	0.517	0.482	0.519	<u>0.018</u>

\* Underlined results indicates non-normality

The main goal of these ANOVA tests was to determine if the response mean of the six country groups belong to the same population. Thus, in order to determine if there was a difference among the language groups and which of them can be considered as members of a similar population, the following hypothesis was set:

$H_0$  CALC  $\mu$  PDI = NOR  $\mu$  PDI = LAT  $\mu$  PDI = ASI  $\mu$  PDI = WES  $\mu$  PDI

And the alternative hypothesis

$H_1$  At least one  $\mu$  PDI  $\neq$   $\mu$  NOR PDI,  $\mu$  LAT PDI,  $\mu$  ASI PDI,  $\mu$  CALC-PDI, WES  $\mu$  PDI

CALC (Central America Latin countries)

NOR (North Germanic countries)

LAT (Latin countries of South America and Europe)

ASI (Asian countries)

WES (West Germanic countries)

The same hypothesis was set for the other three dimensions analyzed (MAS, UNC, and IDV); results are shown in table A.1 and A.2 in appendix A. The six countries groups were compared in the four dimensional factors (PDI, MAS, UNC, IND). Tables A.1 and A.2 demonstrate that all the country groups belong statistically to different populations. The reason to do this is that Mexico is a member of the Central-America countries. Since the Maquila is the focus of this project, Central-America Latin countries' were considered as the base group countries.

Research revealed that those countries sharing common language roots and some history events (see figure A.2 in appendix A) also show a strong similarity in the graphs developed for this study. Possible causes of this result, besides the common language roots, are factors such as closeness and exchange of citizens, either for commerce, studies or political reasons. Graphs of these dimensions show similarities. Similarity is not a coincidence but a reflection of the cultural transfer through language. Proximity and language similarity allow the members of one cultural group to understand the members of another group that share similar behavior. From Central-America Latin countries, only

Mexico shows a high level of individualism compared to the other four countries of the branch

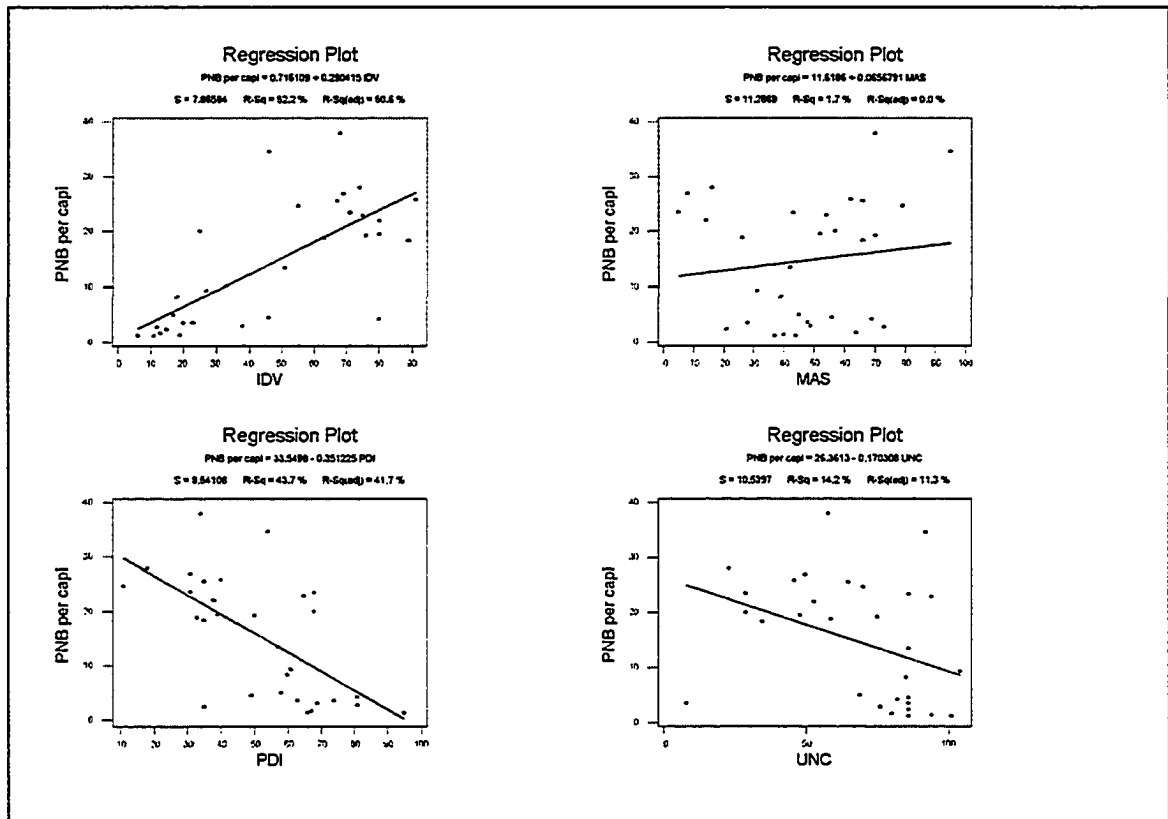


Fig. 3.1. Cultural dimensions vs. countries income per capita

Figure A.4 in appendix A shows that West Germanic language countries show a high level of individualism. With the exception of Austria, all Germanic language countries show a low Power Distance Index, and a high Individualism Index. In figure 3.1 it can be seen that income has a strong correlation with the Individualism Index. Individualism increases with income, but it is not the sole causal factor of this effect. One possible

factor of the economic success from North Germanic countries is the low level of paternalistic behaviors (see figure 3.1). Apparently individualistic cultures prefer to achieve success through individual effort. Even though some work is developed in-group, the main goal is to succeed over the other members of the group whenever possible. Thus working as a team is not the goal; the goal is personal success, but working in groups helps to achieve personal goals. This can be appreciated in cultures that share similar roots such as U.S. and Great Britain. Both countries share a common cultural root. A percentage of the U.S. population descends from German and British ancestors, all of which used to be aggressive to other nations. These countries performed numerous invasions, economic pressures, and wars over other nations. One possible reason for the aggression to other nations is the high level of individualism and the strong level of masculine values; these values power the economic income as a form of success in these cultures.

On the other hand, South America Latin countries have a strong similarity in the Uncertainty Avoidance index value with Central-America Latin countries and with the European Latin countries. Another factor that Latin countries share is historic tradition. Spain dominated a large portion of the American continent for almost 300 years. During this period of time, the Spanish Crown dominated some European countries such as the Netherlands and part of southern France and northern Italy. Also the strong influence of the Roman Empire, which lasted 1000 years, created much of the modern behavior in European Latin countries such as Spain and France; therefore, these countries may share some cultural values. This is reflected in figure A.2 in appendix A.

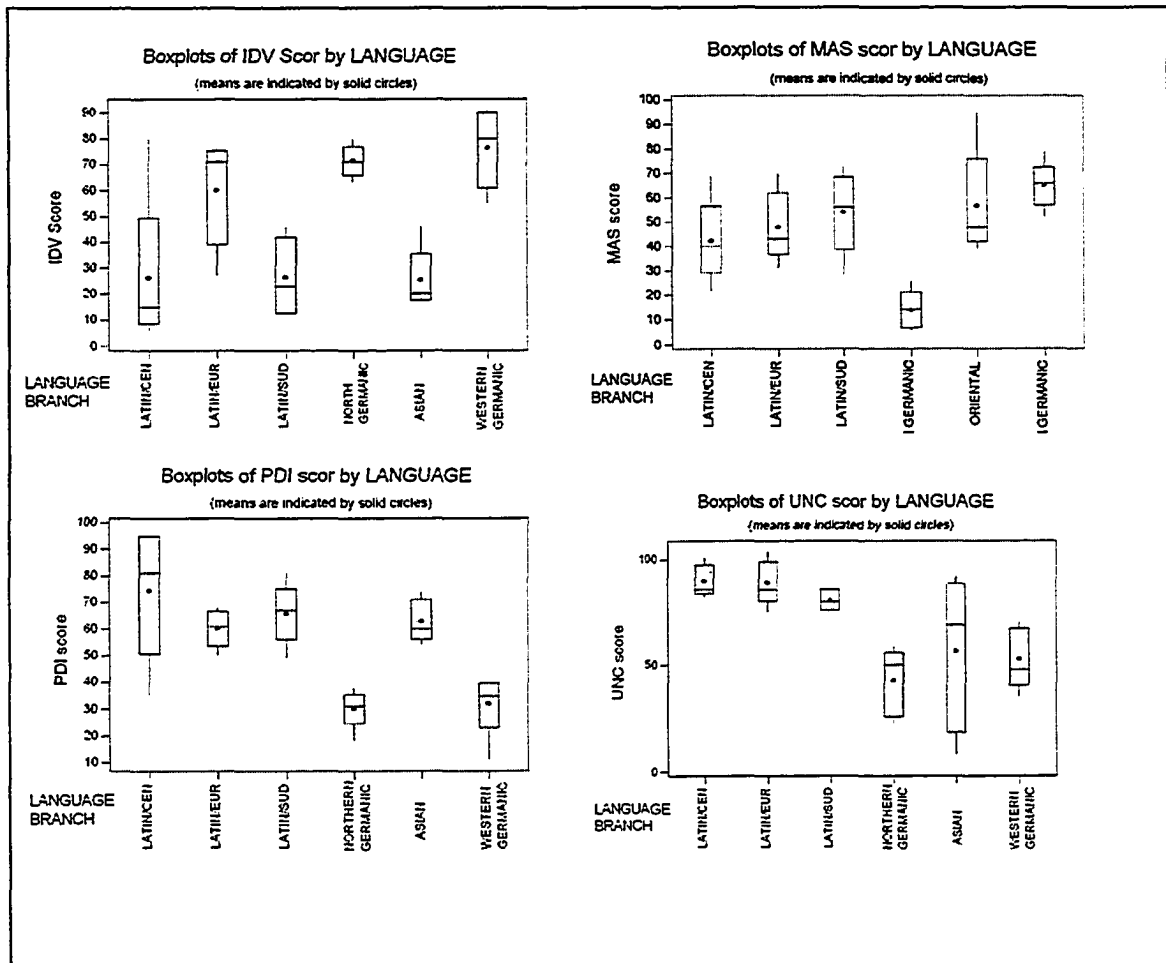


Fig. 3.2. Box plot for ANOVA test of dimensions

### 3.1.2 A statistical analysis of the language influence in culture

When the dimensional factors were analyzed with ANOVA, the statistical results showed that no country groups have similarities in the cultural dimension factors analyzed. Figure 3.2 shows the box plot graph of the ANOVA test made to all the country groups. In the Figure 3.2, UNC and IDV dimensions show substantial similarities for the

Latin countries. North Germanic and West Germanic countries also show substantial similarities with regard to the IDV and PDI dimensions.

Table 3.3 Results of ANOVA tests of cultural dimensions (Central-America vs. All groups, the number indicates p-value of the ANOVA test)

	RESULTS ANOVA CENTRAL AMERICA LATIN COUNTRIES VERSUS ALL OTHER LANGUAGE GROUPS			
CULTURAL DIMENSION	LATINS (SOUTH AMERICA AND EUROPE)	WEST GERMANIC	NORTH GREMANIC	ASIAN
PDI	0.416 Retain Ho	0.009 Reject Ho	0.005 Reject Ho	0.354 Retain Ho
IDV	0.050 Retain Ho	0.008 Reject Ho	0.008 Reject Ho	0.000 Reject Ho
MAS	0.542 Retain Ho	0.324 Retain Ho	0.011 Reject Ho	0.281 Retain Ho
UNC	0.197 Retain Ho	0.000 Reject Ho	0.000 Reject Ho	0.082 Retain Ho

Another ANOVA test was performed. This time the Latin Central-America scores for all the four cultural dimensions (PDI, MAS, IDV, and UNC) were compared to the results of the other five country groups. South American countries and Latin European countries share a common language root; they were grouped in a Latin countries group. The results are shown in table 3.3. From the test, the p-value above 0.05 was considered as the statistical proof that the data from the Central-America Latin countries show similarity to other countries; thus, for all the tests the following hypothesis and alternative hypothesis were stated:

$H_0 \mu \text{ CALC (for PDI, UNC, IDV)} = \mu \text{ NOR (for PDI, UNC, IDV, MAS)}$

$H_i \mu \text{ CALC (for PDI, UNC, IDV)} \neq \mu \text{ NOR (for PDI, UNC, IDV, MAS)}$

$H_0 \mu \text{ CALC (for PDI, UNC, IDV)} = \mu \text{ LAT (for PDI, UNC, IDV, MAS)}$

$H_0 \mu \text{ CALC (for PDI, UNC, IDV)} = \mu \text{ WES (for PDI, UNC, IDV, MAS)}$

$H_i \mu \text{ CALC (for PDI, UNC, IDV)} \neq \mu \text{ WES (for PDI, UNC, IDV, MAS)}$

$H_0 \mu \text{ CALC (for PDI, UNC, IDV)} = \mu \text{ NOR (for PDI, UNC, IDV, MAS)}$

$H_i \mu \text{ CALC (for PDI, UNC, IDV)} \neq \mu \text{ ASI (for PDI, UNC, IDV, MAS)}$

$H_0 \mu \text{ CALC (for PDI, UNC, IDV)} = \mu \text{ LAT (for PDI, UNC, IDV, MAS)}$

CALC (Central America Latin countries)

NOR (North Germanic Latin countries)

LAT (Latin countries of South America and Europe)

ASI (Asian countries)

Table 3.3 shows that Latin countries have similarity in all the four cultural dimensions analyzed to the Central-America Latin countries. The second group that shows strong statistical similarity with Central-America Latin countries is Asian countries, with the null hypothesis of three of the four factors being retained in the ANOVA test. The practical problem is that Asian countries have a different language root.

The language can be a barrier that members of the Asian countries have shown to avoid these language barriers by adapting to the culture in Central-American Latin countries; this is because the levels of cultural dimensions have strong similarities. On the other



hand, Western Germanic and North Germanic countries demonstrated strong differences when they were compared to the Central-America Latin countries. Theoretically, the people of Latin countries will experience a strong cultural shock when they live together with people of Western Germanic and North Germanic countries. Even though Latin countries and Western Germanic and Northern Germanic are geographically close to each other, cultural similarities are not strong according to table 3.4 .One of the reasons to explain this is related with the social structure shaped by the Roman Empire. It must be understood that even though the Roman Empire fell almost 1000 years ago, the institutions in the West and East Roman empires had some influence on how the societies from Latin Europe actually behave.

The tendency towards decentralized governments among North Germanic and Western Germanic societies remained as the practice into the 15<sup>th</sup> and 16<sup>th</sup> centuries when communications through sea and land were reborn as the result of a Renaissance resurgence of a commercial society in the search of new commercial routes. Today, North Germanic and Western Germanic societies still tend to be independent from central governments or authority power; they are highly individualistic societies.

Returning to the result of tables 3.3 and 3.4, Asian cultures show more similarities with Central-America Latin countries. In practice this is hard to verify, but with this background a deeper study in the field can be designed to check if a shock really exists among the members of the mentioned societies. These factors were promoted by the organizational systems developed by hundreds of years of traditions and cultural programmed ways of thinking that were taught with the use of language from one generation to the next. Latin and Asian societies, such as the Italian, Spanish (in the

Roman period and the Muslims occupation), Chinese, Korean, or Mexican, have an old tradition of being ruled by large political systems, or promoters of a large authority. This behavior can be seen in the Roman Empire (the East Empire was formed by regions such as north France, Spain, Italy, Yugoslavia, France, Greece, Romania, and Bulgaria) and the Chinese Empire (which was ruled by emperors almost until the beginning of the twenty century). Other examples are the Aztec and the Inca Empires. These organizational forms were derived from the cultural way of thinking of their members. Such vast

Table 3.4 Cultural dimensions basic statistics

Cultural Dimension basic statistics									
Language Group	N	Power Distance Index		Individualism Index		Masculinity Index		Uncertainty Avoidance Index	
		Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
LATIN CENTRAL-AMERICA	5	<b>74.40</b>	<u>25.08</u>	<b>26.20</b>	<u>30.46</u>	42.20	17.34	<b>89.80</b>	7.63
LATIN EUROPE	5	60.20	7.05	60.00	21.05	48.00	14.75	89.00	10.77
LATIN SOUTH AMERICA	5	65.80	11.54	26.40	15.14	54.00	17.07	80.80	5.02
NORTHERN GERMANIC	5	<b>30.20</b>	7.40	71.40	6.27	<b>13.80</b>	8.14	<b>42.80</b>	15.82
ASIAN	5	62.80	8.07	25.20	12.03	56.80	<u>22.32</u>	56.60	<u>36.53</u>
WESTERN GERMANIC	5	32.00	11.96	<b>76.40</b>	15.26	<b>65.00</b>	9.70	52.80	14.41

empires could exist only if certain amounts of acceptance were part of the society's culture. This level of acceptance of a large power span refers to the culture dimension called the Power Distance Index (PDI). This PDI reflects the level of acceptance of a large or small power span within the members of a particular society.

The political position of many people in Latin America nations after the Conquest Era was that of a province of a central government found in the Spanish peninsula. This created a tradition oriented to centralized governments, which is probably one of the reasons why democracies were hard to implement in Latin countries; the mental programming of the Latin cultures tend to be paternalistic and in certain ways centralized. The comparison of Latin cultures indicates that even though there are similarities among Latin countries, those from Latin America are a little bit different from Latin European countries where the PDI is lower. The lower PDI indicates that the members of the Latin European (Latin/EU) societies were less likely to allow a large authority, or obey without questioning the validity of these orders from a superior. On the other hand, Latin American (Latin/SU/CE) countries, either from the Central or South America, are more likely to accept paternalistic behaviors from the ruling levels (such as teachers, parents, managers, etc.). One of the reasons for this pattern is that America developed its own culture influenced by the mixing of Spanish-Aztec, Spanish-Maya, and Spanish-Inca cultures. One of the important factors to notice is that even societies accustomed to large power distance do not necessarily agree with it. Power distance can turn into negative signs when acceptance of a large span of power is made by the lack of spirit of society's members complaining with the power images (such teachers, father, rulers). Instead of discussing possible negotiated outcomes of disagreements, their mental

programming will push them to either solve the problem based on social ranks (son vs. father, employee vs. manager), obey the higher ranking person's decision, or after several discussions lacking a solution, confront the higher rank. (This can explain the relative common existence of dictators and military corps in Central and South America).

### 3.2 Summary of chapter three.

Through data retrieved from personal observations in a Maquila, it can be concluded that language is the strongest barrier to sharing information with foreign persons. Members of the Korean culture, North American culture and Mexican culture were observed in daily operations; it was appreciated that communication among Korean and Mexican staff was extremely difficult, even though many behaviors were similar (machismo, paternalism, etc.). In fact, the Mexican staff have a stronger understanding of the North American behavior. One of the possible reasons for this understanding is the maquila's close proximity to the United States. Another possible reason is the same language root for both Spanish and English (Indo-European dialect). Furthermore, the more highly educated Mexican staff have absorbed many Anglo-Saxon behaviors that originated in the United States. One of the reasons for this is the strong economic and social tie between the United States and Mexico. Television, movies, publicity and literature have an important influence on much of the Mexican population. Many wealthy people from Mexico study in the United States; continuous economic investments from the United States Mexico also carry many cultural interchanges. Managers from

American corporations hire Mexican staff for their facilities in Mexico, generating a strong economic interchange.

Another cultural dimension analyzed in table 3.3 is the Individualism Index. (IDV). This dimension is the factor that explains what is the amount of individualism promoted or allowed by the society in the daily interactions within the members of that society. The importance of this factor is based on the fact that some societies encourage the interaction of their members to achieve a common goal. On the other hand, there are societies that promote the personal success above the group success. Some societies are highly selfish; meanwhile, others encourage group goals. One of the possible explanations of this is the fact that some societies show a larger family unit. Many times these larger families do not allow the parents to focus on a single child all the time; the attention and resources must be shared among the members of the family. This creates a propensity to share easily with groups.

Industrialized countries show high levels of individualist behavior. It is possible that industrialized countries promote individualistic behavior because the number of members in city families normally is reduced if compared with country families. Other possible causes of individualistic behavior are the environment, level of crowding, and resource scarcity. This factor is important as a cultural dimension because it is one of the characteristics that helps to define the basic values of a society as a whole.

One of the problems to achieve a cultural coexistence is the language difference. That is, maybe the cultural values are similar, but the bridge between the values of one person and another is hard to build. Differences on grammatical structure, sentence structure and physical communication can be a potential problem (Torres [25]).

A third dimension analyzed in table 3.3 was the Masculinity Index (MAS). According to Hofstede [2], this value reflects the mental programming of how a society or any human group values its members' achievements. One of the possible outcomes is to value feminine achievements, such as cooperation, friendship, collaboration, and support. On the other hand, some societies promote the achievement of masculine goals, such as income, recognition, and power. It can be seen (table 3.3) that the Latin European countries share similarities with the Central-American Latin countries in this factor. It is possible that motivational programs can be applied with success in countries such as Mexico, Salvador or Nicaragua. It is important to understand that the values can be similar even though language differs. North Germanic countries share values opposite to those of the Latin countries; it is possible that programs implemented by Swedish, Finn or Dutch managers in Mexico will find some resistance.

The last of the dimensions analyzed with the results of table 3.3 was the Uncertainty Avoidance Index (UNC). This index reflects the levels of anxiety among members of a society. Some societies develop more or less easy going attitudes; meanwhile, others tend to be more stressed. High levels of stress will indicate a high UNC value for that society. (See table 3.4). Table 3.4 shows that Latin European societies share similar UNC levels with Central-America cultures. By this factor, it can be stated that regulations and behavioral codes share similar values with Latin European and Mexican cultures. It can be further stated that the common cultural origin for some of the Latin European countries and Mexico is one of the factors for similar values. Some similarities can be found among Latin American countries and Asian countries; the

reasons for these similarities can be found in the base values shared by the indicated societies.

Common problems can lead to the development of common solutions. Even though they are not in direct contact, the social organization developed by Chinese, Japanese, Spanish and Mexican societies share similar values; the main difference is the language and some superficial behaviors. Tables 3.3 and 3.4 can be used as indexes of how the values of several countries are similar. In order to avoid culture shock and misunderstandings during the translation process, communications should be improved.

CHAPTER 4  
A PRACTICAL STUDY OF MOTIVATION IN THE MAQUILA INDUSTRY: FIRST  
AND SECOND SURVEYS

Human perceptions, such as motivation and cultural shock, are the main focus of this thesis. Obtaining subjective data like motivation normally is done with a written survey. For example, in this thesis several surveys were developed to measure some human perceptions. Human motivations can be obtained with a survey, but unfortunately, emotional states of the employees can affect the results in a written survey. However, emotional states are transitory, therefore surveys results can be trusted as a reliable method.

Surveys provided the data sought in this research, such as the effects of mental programming and culture. This was done without the negative effects of transitory emotional states. In this thesis, three surveys were designed to analyze culture and motivation. The initial two surveys analyzed motivation in several maquilas located in Mexico. The last survey was developed in several maquila facilities to analyze the levels of the cultural dimensions, such as Individualism Index, Masculinity Index, Uncertainty Avoidance Index, and Power Distance Index. The results obtained from the last survey were evaluated with several statistical tests.

In summary, the surveys had three basic premises. The first was to establish the factors that maquila personnel consider important from a motivational point of view. The second was to establish to what degree employers meet these factors in their current



companies, and the third was to make a comparison of the expectations of Mexican staffs versus other nations' staffs.

#### 4.1 Research methodology

##### 4.1.1 Survey for analysis of satisfaction factors in the maquila industry (survey one)

Survey number one was designed to rank satisfaction factors of Mexican maquila employees. Ranking motivation factors according to each respondent culture was the other function of survey one results, thus a comparison between American and Mexican professional staff was made. Establishing a numerical value of subjective terms, such as happiness and satisfaction, allows for analyzing the data with some simple procedures. The target group of survey one was Mexican expert staff of maquilas, such as electrical engineers, mechanical engineers and industrial engineers.

Survey number one was applied to eleven R & D members of LG electronics. The basis of survey one was a survey designed by Eugene Raudsepp [3]. Thus, some factors in survey number one were contained in the survey designed by Raudsepp [3].

Survey number one was sent by e-mail or hard copy and was delivered to 35 staff members of LG electronics. The number of staff who replied to the surveys was 11. The response rate of the population sample surveyed was 31% (11 out of 35 engineers responded). These surveys were conducted over a period of time between September 2001 and October 2001.

#### 4.1.2 Evaluation of Motivation Factor Hierarchy

Survey number one was designed to rank the motivation factors given by the respondents. The respondents indicated their perception of the most important motivation factor with the number one. The second most important factor was indicated with the number two, and the rest of the factors were subsequently ranked until all eighteen factors listed in survey number one were ranked. A Motivation Factor Hierarchy (MFH) is a value for a motivation factor developed with the Inverse of Ranks (RR) of the factor value given by each respondent of survey number one. The MFH (Eq. 2) goal is to indicate the ranked importance of those factors according to Maslow's hierarchy [1] of needs. The formulations are as follows:

$$IMF_1 \dots F_{19} = \frac{RR}{1} \quad (1)$$

$$MFH \text{ Physiological needs... Self actualization} = \frac{\sum IMF}{n} \quad (2)$$

Where  $\sum IMF$  is the sum of inverse of the respondent's answer to each factor listed in survey number one,  $n$  was the number of factors that composed each hierarchy (such as salary, regular increase in salary, job availability, physiological needs; see table B.3 in appendix B), and MFH was the value derived from averaging the inverse numbers of the ranks obtained during the study. Higher MFH values indicate greater importance of the motivational factor for the respondents of survey number one. Personal observations have led to the assumption that the motivation factors for each cultural group will be different because they will reflect the individual's mental programming; thus, the results obtained

will help in stating which factors differ between American and Mexican staff. The main reason to compare American and Mexican staff is because Mexican and American cultures have more interactions in the maquilas. As a result, the findings obtained from survey number one were matched to those of the Eugene Raudsepp's [3] survey with the intention of determining if the motivation factors have the same importance for Mexican and American professionals. If this is correct, the same motivation methods applied in the United States could be used in Mexico.

Whitney's test was used because it is a non-parametric test that determines if groups belong to the same population, thus indicating if there is a different satisfaction perception with regard to factors questioned between the two indicated groups.

Table B.1 (see appendix B) shows the results obtained from survey number one. Table B.1 shows the summary data for survey one. The ranked scores average in table B.1 shows that salary is the most important motivational factor for the engineers working in a maquila (salary was ranked the number 1 motivation factor with an average of 40, see table B.1 and table B.2); the least important factor was the person's loyalty to the company (loyalty was ranked 19 with an average of 179, the last rank available, see table B.1 and Table B.2). To be brief, money is the most important factor for Mexican staff. As a result, loyalty to company is very low in the hierarchy of motivational factors. Of course, this is somewhat contrary to the customs of some cultures in which the company comes first. In those instances, the group is more important and advancement is thought to happen as the result of teamwork rather than personal advances. When compared to the results (Research & Development) found by Eugene Raudsepp [3], data from survey one

showed that ranks of hierarchy given to motivation factors differed greatly between Mexican engineers and American engineers (see Table B.2 in appendix B).

Human beings in modern economies have the same economic and basic needs, such as food and shelter. Besides these basic needs, the experiences during early childhood determine the values and practices of each human being; these values and practices influence the perception of what activities and rewards are important. For example, in societies where income is a symbol of success, an unconscious need for a high economic income during adulthood will be programmed in the individual's mind. Therefore, the continuous and unconscious "programming" of economic needs will drive the individuals to search for a higher income. Values such as income may change from one social group to another because these unconscious motivators evolve according to an infinite number of factors, such as environment, wars, and communication.

Given these results (see Table B.2) values of Mexican and American staff differ. Other factors, such as age and marital status, have an important influence on the motivation of people, but these factors are hard to analyze and will not explain the society profile. One of the main statements of this thesis is that behaviors, not environmental factors, determine a cultural group's success or failure to survive, and behaviors evolve and are transmitted from the oldest members of a community to the youngest through the language and daily practice of these behaviors. Therefore, when two or more cultural groups interact, the different perceptions of the world may clash, depending on the nature of the societies' differences. Survey number one results indicated some important differences between the Mexican and American professional staff. While for American engineers, the most important motivational factor was the type of task developed in the

work place, for the Mexican engineers, the salary level was the most important factor (see table B.2). Figure 4.1 examined the factors questioned in survey number one and their relation with Maslow's Hierarchy of needs [2]. All the ranks obtained from the surveys were weighted by dividing their rank (RR) with one. Thus, the factor that achieves the first place in importance will be granted a weight value of 1. ( $1/1=1$ ); meanwhile, the factors that achieve the 16<sup>th</sup> place will get a weight value of 0.062 ( $1/16=0.062$ ). After obtaining these inverse values from each factor's rank (IE), they were added and matched according to the correspondent hierarchy level defined by Maslow (see Table B3 in appendix B).

	Original rank	MHF give by Mexican respondents
	<b>5</b>	<b>Safety and security</b> 0.075
<b>Esteem needs</b>	<b>4</b>	Love needs 0.101
<b>Love needs</b>	<b>3</b>	Esteem needs 0.107
<b>Safety and security</b>	<b>2</b>	Self actualization 0.279
<b>Physiological needs</b>	<b>1</b>	Physiological needs 0.342

Maslow's Hierarchy of needs

Figure 4.1 Survey one averages match to Maslow's function

Figure 4.1 shows how Maslow's hierarchy of needs was rearranged according to the results of survey number one. The results obtained were completely different from

those indicated by Maslow. Safety and security did not follow physiological needs as they did in Maslow's hierarchy. Instead, self-actualization was the second most important factor for the Mexican professionals; the same trend was appreciated with the other hierarchy levels. It should be understood that Maslow developed a very good theory for the American culture, although his theory shows some influence from his cultural background. Therefore, the hierarchy should be reviewed according to each cultural group. These results will allow for the analysis of survey number three, which deals with the influence of the culture in daily behaviors of social groups and their motivational factors.

#### 4.1.3 Conclusions for survey number one

The results of survey number one indicate that motivation for American and Mexican professional are different. If the survey is applied to other professional of other countries, the possibility of finding differences in the motivation factors is there. Motivation is strongly related to the cultural background; this will be studied in depth with survey number 3. Because survey number one does not indicate cultural differences among American professionals and Mexican professionals, survey three was developed. Survey two will indicate only the current motivation levels among a group of Mexican professionals.

#### 4.1.4 Survey to evaluate maquila staff motivation levels (survey two)

After obtaining the results for survey number one, survey number two was conducted to investigate if maquilas were adequately addressing their staff motivation factors.

One important piece of background information that must be considered is that survey two measures the motivation level of Mexican professionals in different companies. The common background of these professionals is that all of them were, at some moment, employees of a Maquila located in Reynosa (LG electronics de Reynosa), Mexico. A portion of these professionals quit the company in order to switch to other companies. One can state that those persons who switched from the LG Company did so because they were likely to obtain better motivation for performing their tasks in their new company than in LG Electronics. Therefore, survey number two measures the degree of current job satisfaction among the surveyed persons. Based on the level of satisfaction obtained from survey two, one can state whether management fulfills the needs of its staff, and then make a correlation to determine which foreign management better fulfills its employees' needs.

At the moment of the survey, the surveyed persons were members of different companies. Those companies where survey number two was applied were Mattel (molding and assembly plant in Santa Catarina, N.L.), GE (high transformer division in Monterrey.), LG-Zenith (TV assembly plant in Reynosa, Tams.), Siemens (automation products at Guadalajara, Jal.), and Square D (container division in Monterrey, N.L.). The respondents from Mattel, GE, Siemens, and Square D are former employees of LG

Electronics, all of whom worked an average of two years at LG Electronics before they left the company. To determine which motivation factors differed between LG staff and ex-LG staff, a statistical analysis was performed. The respondents of survey number two were three members of Montoi R & D department, two members of General Electric, two members of Siemens R & D department, and one member of Square D. In addition, the survey was applied to twenty-one staff members of LG Electronics in Reynosa. In total, twenty-nine people responded to survey number two. All respondents of survey two had at least a bachelor's degree and four of them had a Master's degree. In addition, ten percent of the sample group was females. Survey number two consisted of twenty-five selection questions and six open ended questions about the demographic profile of the respondents.

Each question in survey number two has a weighted possible answer value from one to four on a Likert scale, where one is the preferred value granted to any of the questions and four is the least preferred. Consequently, low scores indicate a higher level of satisfaction among the survey respondents. This second survey is described in table B.4 and table B.5 (see appendix B).

Table B.6 (see appendix B) shows the results of the surveys applied. In the results of the survey, lower numeric values (i.e. 1) in the response of each cultural question indicated a high level of satisfaction on the motivation factor, either to join the company or to keep motivated in daily activities. Therefore, those questions that were equal to the sum of the number of respondents indicate an optimal level of satisfaction (i.e. for 29 surveys, a sum equal to 29 indicates that all the respondents chose the option 1 of the Likert scale).



The results of each questions achieved with the applied surveys were divided by the target score of each question; this indicated a Ratio of Satisfaction (RS). It can be appreciated that none of the twenty-five questions reached a ratio of 1 or 100% for Table B.6. Thus the RS was calculated as follows:

$$RS_{question_1} \dots RS_{question_{25}} = \frac{SR}{T} \quad (3)$$

Where SR is:

$$SR = \sum \text{Respondents answer } R_1 \dots R_n \quad (4)$$

Where T is equal to:

$$T = \sum \text{target of } Q_1 \dots Q_{25} \quad (5)$$

And n is the number of respondents in the sample.

A RS of 1 in any particular question indicates that employee satisfaction was optimal for 100% of the sample. It can be appreciated that none of the satisfaction ratios for the questions made in survey number two results achieved a 100% of satisfaction for the sample surveyed (see table B.6). Table B.6 indicates the results for the entire sample surveyed, both the current LG staff members and former LG Electronics members. For table B.6, the higher levels of satisfaction are indicated in the left columns of the table.

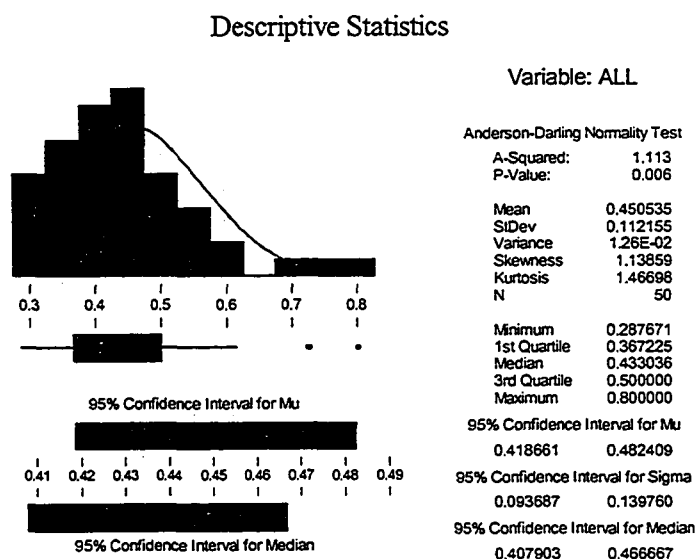
Question eighteen (Q18) with a RS of 0.74 (74%) is the one with the highest levels of satisfaction in the sample of table B.6. This question measures the grade of satisfaction of the respondents related to how their opinion influenced company decisions. The motivational factor receiving the lowest satisfaction ranking was the frequency of salary increases, as indicated by question 8. (Q8). This indicated a 0.32

satisfaction ratio when expected optimal ratio was 1.00. Therefore, from the sample surveyed, the motivation factor less promoted by management in the maquilas is the frequency of the staff salary increases, according to staff perception. Salary increase periodicity is important in a country like Mexico, where in the previous 25 years, continuous inflation reduced the purchase capacity of the employees. It is possible that where inflation is lower, foreign managers will not understand that the regular increase in salary is not an exaggeration for a country where inflation levels can reach 400% in a year. In recent years, inflation was controlled by the government, but the previous economic crisis reduced the “peso” value. Therefore, it is a common request of the Mexican staff for regular salary increases since sometimes even basic needs are difficult for a Mexican staff to fulfill. The results for both groups LG employees and former LG employees can be seen in Tables B.7 and B.8 in appendix B. For all the factors the LG staff members show lower levels of satisfaction (See Figure B.1 in appendix B).

One can deduct, at least for the sample of survey two, that the management of the LG maquila is not fulfilling its staff's needs as well as the management of former LG staff. The reason for this is possibly because the management does not realize the needs of its staff, or the management wants to establish reward and management policies different from those expected by its Mexican professional staff. One can also notice that changing to another company really improves former LG staff satisfaction of daily tasks. At the time of survey two's application, the management of LG electronics was part Korean and part American. According to Cho [36], the Korean companies in Mexico apply repressive management methods; they suppress unions and try to apply a repressive management method. In the case of LG, the management policies had not become

extremely oppressive, but they were different from the policies applied by the previous management, which was basically formed by American citizens. The current LG Electronics maquila used to be Zenith electronics; it was founded in 1977, but in 1998, it was acquired by LG electronics. The transition from an American management style to a Korean management style created many conflicts with the professional staff. The former LG employees left the company in the period posterior to LG Electronics' acquisition of the Zenith Company. When some policies started to change (salary increase periodicity, percentage of salary increase, and massive firing of personnel), some of these staff members looked for other companies to fulfill their needs.

Fig. 4.2 Descriptive statistics for results of survey two



Figures 4.2, figures B.2 and figure B.3 (see appendix B) show the descriptive statistics for the overall sample group satisfaction ratio, the LG Electronics current members satisfaction ratio, and the former LG Electronics staff members' satisfaction

ratio. In these graphs, it can be appreciated that none of the groups of data belonged to normal distributions. Normality is an assumption required to perform an ANOVA test. One of the analysis' goals was to compare the satisfaction ratio results of the LG current members and the LG former staff members. It must be considered that the former staff members left the LG Company in order to satisfy those needs that LG did not cover. In order to determine if both groups motivation ratios were statistically part of a similar population, a test with the Mann-Whitney method with MINITAB™ was performed considering the data from both groups as non-parametric data (non-normal). The hypothesis for this test then was determined as follows:

Ho M satisfaction ratios of LG current staff = M satisfaction ratios of LG ex members

The alternative hypothesis was:

Hi M satisfaction ratios of LG current staff  $\neq$  M satisfaction ratios of LG ex members.

The results of the test are shown in table B.9 (see appendix B). The results of the tests indicate the two groups belong to different populations, at least for questions 1,2,9,11,12,17 and 24. From figures B.2 and B.3, it can be appreciated that the average satisfaction ratio of the LG members is lower than the satisfaction ratio of the ex-LG staff members. On the other hand, the standard deviation of the former LG staff members is larger than the standard deviation of LG members (0.094 for LG members and 0.106 for the former LG staff members). The results obtained in survey two show that salary is the main motivational factor for the employees, and company loyalty appears to be a less important motivational factor. A possible extension to this part of the study will be to refine this list of factors and to establish reasons why maquila engineers consider these

factors important. In addition, perhaps a study to establish whether there is significant difference in the factors as engineers progress in their professional careers. The second survey showed that a lack of fulfillment of some of the motivation factors exists in the employees of the companies surveyed; furthermore, there is a significant difference between LG Company management and the former LG staff's management ability to fulfill staff needs. Basically, LG is not fulfilling some needs of its professional staff; the former staff of LG electronics is more motivated than the current LG staff. Apparently, the former LG staff succeeded in getting better jobs, according to their objectives. In this case, the former LG staff looked to fulfill their needs in other companies rather than achieve them in LG electronics. This lack of capacity to fulfill the staff's needs in a maquila company could increase turnover and conflicts between staff and management within the company.

## CHAPTER 5

### A PRACTICAL STUDY OF CULTURAL DIMENSIONS IN THE MAQUILA

#### INDUSTRY:THIRD SURVEY

The third survey performed was designed based on the cultural dimensions determined by Hofstede [2]. The arguments of the Hofstede analysis will fulfill the need of this thesis to try to understand the influence of the cultural background on motivation during daily tasks at maquilas.

The four cultural dimensions defined in chapter three explain many deep-rooted behaviors. The personality of each person in a work environment plays a significant in the behavior shown in any work situation, but group thinking is more important if one takes into consideration that personalized motivation cannot be a practical activity in a large company. One objective of this thesis is to achieve guidelines to lead a group of persons in a cross-cultural situation, not to deal with the psychology of each individual.

#### 5.1 Survey to analyze cultural dimensions in the maquila environment (survey three).

Survey three was applied to twenty persons from the United States, Mexico, and Korea who were working in different corporations. Five of the respondents belong to Asian countries (Korea, Japan, Taiwan), five more were natives from countries with

Western Germanic language roots (U.S. and England), and the last ten respondents were Mexican (five of them professional or technicians and five more were laborers from a maquila facility). The results were categorized according to the language group, except for the Mexican professionals and laborers. They were separated into two groups: one containing only Mexican professionals and the other only Mexican laborers. The purpose for the group divisions was to get enough information to determine if the language groups show similarities or deep differences between them. The decision of dividing the Mexicans into two groups was made in order to determine if the education level influences the cultural values of the groups. This is possible because in Mexico, as in many other countries, the education level creates subgroups within a culture, thus the lack of interaction between the members of a society with different academic levels creates a cultural gap between them.

For this research, it is concluded that education in Mexico is one of the factors that influences the creation of a social class division in Mexico (also combined with a portion of racist behaviors from upper classes towards lower social classes). In order to determine if groups exist within a society subculture, the analysis of survey three results was made with two Mexican groups as mentioned above. These factors define the profile of cultural mental programming; this is the value that define how a group of people behave under the influence of the behavior learned from the surrounding members of society.

The third survey consisted of nineteen questions that were designed to evaluate the perception of the following dimensions. Power Distance Index, Masculinity vs. Femininity, and Individualism vs. Collectivism. The questions prepared on survey three

to measure the mentioned dimensions were open-ended questions, with four possible answers on a Likert scale. The given weight of each answer is proportionally related to the question. For example, the first and second questions refer to the respondent's relationship with authority.

Question 1: How would you describe your feeling of fear when you disagree with a manager?

- Option a) You don't feel any fear of exposing your point of view. (If chosen, value is 1.)
- Option b) You need to expose your point of view sometimes. (If chosen, value is 2.)
- Option c) You don't show fear; just respect the boss' decision. (If chosen, value is 3.)
- Option d) High fear of disagreement and discussion. (If chosen, value is 4.)

A response of Option 'd' shows the greater possible weight. People that show a high level of distance from their power figure, such as boss, father, or schoolteacher, will select this answer. On the other hand, persons that choose option 'a' are those persons that are used to arguing when tasks and assignments were given to them. Answers 'b' and 'c' show the intermediate options for those that are neither too distant from the power figure nor too close to it. The root of this behavior, according to Hofstede [2], is the perception of how persons deal with the fact that inequalities exist in a society. This perception is strongly related to the education received during childhood. In those societies where a high level of distance from the power center is constantly taught, a high



respect for elders is learned. Parents have an active power image even after their kids grow. Ranks and obedience are strongly promoted, and a high dependence on the parents and relatives is developed in the early years. On the other hand, those persons that show less distance from the power image are more likely to have been raised in an environment where independence or self-dependence was promoted. Thus, children were treated more as equals, contradictions were accepted, and independence from adults was promoted.

Question 2: How do you prefer that your manager make his decisions?

- Option a) He will consult with his group before making decisions (If chosen, value is 1.)
- Option b) He makes decisions but consults you before decisions are made. (If chosen, value is 2.)
- Option c) He makes decisions and explains to you after making it. (If chosen, value is 3.)
- Option d) He makes decisions without consulting, only based on his criteria and responsibility. (If chosen, value is 4.)

The answer to this question reflects the desired type of manager from the respondent. It is expected that preference for paternalist management will be chosen by those persons who were raised with this type of behavior from their parents. These types of behaviors seem to be common in those countries where high Power Distance (PD) exists. The effects of these high PD were mentioned in previous paragraphs

Those persons that feel more comfortable in a high PD environment will choose answer 'c' or 'd', indicating a preference for high PD values. As a result, PD can have a negative effect. Those societies, where discussions occur with the power figure, such as the father, supervisor and teacher, are not common; a high PD indicates an effort to avoid sharing responsibility about decisions with a power figure that is not cooperative.

Consequently, if the staff in a facility is angry with a supervisor because of some work issue but the staff belongs to a paternalistic society, a discussion will not develop. As a result, disagreement with a power figure can switch either to anger or fear towards the power figure.

Question 3: Do you prefer a large amount of time for personal needs or do you feel indifferent about this?

- Option a) The job is my priority; personal needs can wait. (If chosen, value is 1.)
- Option b) I would prefer to spend more time on the job. (If chosen, value is 2.)
- Option c) I feel indifferent about having more free time or working more time. (If chosen, value is 3.)
- Option d) I prefer larger amounts of time for personal needs. (If chosen, value is 4.)

This question was generated in order to get the level of collectivism/individualism shown by the respondent. The last option indicates a high level of individualism. However, option "a" shows a high commitment of the respondent to the company. Commitment to the company is expected in respondents raised in a paternalistic family. In those families with grandparents living with their sons, everybody is expected to cooperate with the family. This is common in those families formed by

many members. In large families, individualism is not important; private rooms per child, special food, and individualistic behaviors are not promoted. Instead, in families with a low number of members, individualistic behavior and more time will be dedicated to each member of the family. Persons in individualist societies are more comfortable making efforts to improve their personal level of life.

Question 4: In your daily tasks, do you prefer to make a personal approach to get the job done or do you prefer to guide your self by the book?

- Option a) I prefer to follow the established systems and rules. (If chosen, value is 1.)
- Option b) I try to follow the system most of the time, but only sometimes do I act by myself. (If chosen, value is 2.)
- Option c) I follow the system and my decision at the same rate. (If chosen, value is 3.)
- Option d) I do prefer to do things my way. (If chosen, value is 4.)

Achievement is closely related to individualistic behavior, and this includes jumping barriers and rules sometimes. In collectivist societies, high respect/fear for rules and procedures is common. Individualistic societies play to achieve practical goals; rules and procedures are valid, but personal results are more important.

Question 5: How do you prefer to get achievement?

- Option a) I complete regular daily tasks. (If chosen, value is 1.)

- Option b) I do a regular task and some very challenging tasks sporadically. (If chosen, value is 2.)
- Option c) I Perform either a very challenging or regular daily task. (If chosen, value is 3.)
- Option d) I enjoy an extremely challenging task. (If chosen, value is 4.)

High values in this question's responses are an indication of high individualism behavior from the respondent. Extremely challenging tasks will be selected for those persons that want to improve their personal position. People educated within an individualistic environment will be more comfortable with being rewarded on an individual basis. Choosing answers such as answer "a" indicates a high individualistic behavior. Those persons under paternalistic management systems will prefer less challenging tasks.

Question 6: How important to you are training opportunities in a company?

- Option a) It is the most important factor of the company where I work. (If chosen, value is 1.)
- Option b) It is important but is not the top of my expectations. (If chosen, value is 2.)
- Option c) If there is training it is ok; if not it is also ok. (If chosen, value is 3.)
- Option d) Training is not necessary for me to feel comfortable in my job. (If chosen, value is 4.)

Question 7: Do you require environmental conditions in your work area to be excellent or just regular to perform your tasks?

- Option a) I think that environmental conditions should be excellent. (If chosen, value is 1.)
- Option b) Good environmental conditions are ok. (If chosen, value is 2.)
- Option c) Either having excellent or just regular conditions is ok to perform the job. (If chosen, value is 3.)
- Option d) Having the tools and equipment necessary is enough; other environmental conditions are not absolutely necessary. (If chosen, value is 4.)

Question 8: How important to you is the development of your technical skills to get the job done?

- Option a) It is extremely important. (If chosen, value is 1.)
- Option b) It is just important. (If chosen, value is 2.)
- Option c) It is either important or unimportant. (If chosen, value is 3.)
- Option d) It doesn't have any importance. (If chosen, value is 4.)

Questions 6 through 8 refer to the grade of collectivism shown by the respondents. High value answers were expected from those persons gratified with individualistic management systems. These questions indicate whether or not the companies are paternalistic according to the respondents' perception. On the other hand, questions 6, 7 and 8 reflect low values when the respondent prefers paternalistic behavior.

Questions 9 through 15 reflect the perception of the achievement through a masculine perspective or through a feminine perspective. Here the term feminine and masculine refers to which traditional behavioral roles of achievement were instilled. Normally in the primitive societies, it was expected that man succeeded or achieved goals outside the formal home in activities such as hunting, fishing or in conflicts with other societies. On the other hand, feminine achievements were related to taking care of the family, children and issues that occur inside the home. In some societies, feminine or masculine roles are promoted by the oral and daily behavior of the ancestors; this process occurs from one generation to the next. Some masculine values are earnings, recognition, advancement, and obtaining political positions. Questions 9 to 15 will reflect high values when the respondent prefers masculine values.

Question 9: Do you prefer that high earnings come from personal effort or be shared within the working group to which you belong?

- Option a) The group performance must be rewarded, not the individual efforts. (If chosen, value is 1.)
- Option b) I think that group focus on rewards is better; personal requirements are secondary. (If chosen, value is 2.)
- Option c) I prefer to get better earnings by my personal effort but considering the group performance. (If chosen, value is 3.)
- Option d) I prefer to gain earning for my personal effort only. (If chosen, value is 4.)

Question 10: How important to you is recognition for your achievements, or do you prefer other types of rewards, such as training or promotions?

- Option a) I prefer other types of rewards. (If chosen, value is 1.)
- Option b) Either recognition or other rewards are ok. (If chosen, value is 2.)
- Option c) It is relatively important. (If chosen, value is 3.)
- Option d) It is extremely important. (If chosen, value is 4.)

Question 11: Do you prefer a working environment where opportunities to move to higher levels are available, or do you prefer other types of opportunities (i.e. training, higher wages)?

- Option a) Opportunities different from promotions are preferred. (If chosen, value is 1.)
- Option b) Either promotions or other types of rewards are ok for you. (If chosen, value is 2.)
- Option c) Promotions are as good as other rewards, but promotions are still preferred. (If chosen, value is 3.)
- Option d) I prefer that promotions be offered. (If chosen, value is 4.)

Question 12: Do you prefer a challenging job to feel accomplished?

- Option a) Regular tasks make me feel satisfied. (If chosen, value is 1.)
- Option b) I'm indifferent to a challenging job. (If chosen, value is 2.)
- Option c) Challenging is acceptable. (If chosen, value is 3.)
- Option d) I strongly prefer a challenging job. (If chosen, value is 4.)

Question 13: Is it important to you to have a good relationship with your manager?

- Option a) It is very important. (If chosen, value is 1.)
- Option b) It is important but not essential. (If chosen, value is 2.)
- Option c) It is not fully necessary. (If chosen, value is 3.)
- Option d) If the job is done, it is not necessary. (If chosen, value is 4.)

Question 14: Do you prefer to work in an environment where group cooperation is primary?

- Option a) Yes, I prefer this the most. (If chosen, value is 1.)
- Option b) I like cooperation, but it is not essential. (If chosen, value is 2.)
- Option c) Either personal achievement or group cooperation is ok. (If chosen, value is 3.)
- Option d) I prefer to work on my own. (If chosen, value is 4.)

Question 15: What is the importance of living in a city or neighborhood with modern facilities, such as a large city or highly modernized areas?

- Option a) To me this is a priority. (If chosen, value is 1.)
- Option b) I am indifferent, but would rather live in such an area. (If chosen, value is 2.)
- Option c) I am indifferent but would rather not live in such an area. (If chosen, value is 3.)
- Option d) It is not essential to fulfill my necessities. (If chosen, value is 4.)



Communal achievements relate to feminine behavior; those types of achievements are accomplished when social organization and cooperation is common. Most of the time, this is promoted under feminist values, such as communal growth, or seeing the community as a large family; selfish or masculine values pass to second term. Questions 9 to 15 reflect low values when the respondent prefers feminine factors. The last four questions were designed to determine the culture profile and how the members of that community deal with unknown situations. There is a certain ambiguity with these cultural dimensions. Uncertainty Avoidance will reflect the anxiety of the society's members to those unexpected situations. High values in the last four questions reflect a high level of Uncertainty Avoidance. This will explain why some societies prefer highly structured rules and laws: because of the lack of experience dealing with actions outside the rules or what the book dictates.

Question 16: Is long-term job security important to you?

- Option a) It has never been a problem. (If chosen, value is 1.)
- Option b) I can handle losing the job without a large amount of stress. (If chosen, value is 2.)
- Option c) A long-term job is better, although it is not my ultimate goal. (If chosen, value is 3.)
- Option d) It is very important. (If chosen, value is 4.)

Question 17: How often do you feel nervous or tense at work without a feasible threat?

- Option a) Never, I can handle stress very easily. (If chosen, value is 1.)
- Option b) Some of the time I feel nervous. (If chosen, value is 2.)
- Option c) Very often I feel nervous. (If chosen, value is 3.)
- Option d) Most of the time I feel nervous. (If chosen, value is 4.)

Question 18: Do you agree that company's rules should not be broken, even if breaking the rules can be beneficial for the company?

- Option a) The important thing is to benefit the company; I can handle the risk of breaking the rules.(If chosen, value is 1.)
- Option b) I can follow the rules or decide by myself. (If chosen, value is 2.)
- Option c) I try to follow the company rules as much as possible. (If chosen, value is 3.)
- Option d) I fully agree. (If chosen, value is 4.)

Question 19: How long do you want to be part of this company?

- Option a) No more than 2 years. (If chosen, value is 1.)
- Option b) 2 to 5 more years. (If chosen, value is 2.)
- Option c) More than 5 years. (If chosen, value is 3.)
- Option d) Until I retire. (If chosen, value is 4.)

The results for survey three are shown in table C.1 (see appendix C). The results indicate the value given by each respondent according to the scores explained on the

previous pages. It is important to notice that all the respondents have a bachelor's degree, with the exception of the Mexican laborers. Besides, all the respondents belong to companies located in the maquila area of Reynosa and Monterrey or were related with the maquila in those areas. The respondents' cultural group can be identified with the row title.

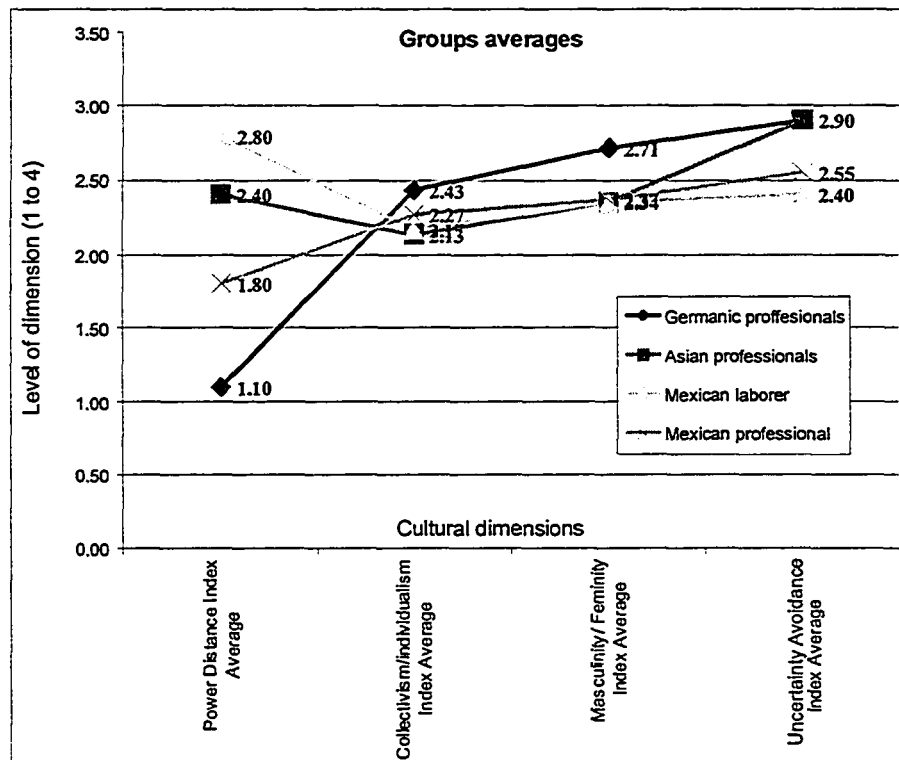


Figure 5.1 Survey three: cultural dimensions for each language group

The groups are Western Germanic, Asian, Mexican laborer and Mexican professional. All survey three respondents, except the five Mexican laborers, were professionals. Figure 5.1 is a graph of the averages for each of the cultural dimensions analyzed with survey number three. It can be noticed that the greatest differences between the respondents groups are the Power Distance Index (PDI) and Uncertainty

Avoidance Index (UNC). It is important to note that Power Distance in the Western Germanic language is the lowest factor as compared to the other three groups. On the other hand, Mexican laborers show a high level in the Power Distance Index. This is an indication that the Mexican laborer is used to establishing large distance or respect between them and their superiors (managers, fathers, etc.). Another issue noticeable in figure 5.1 is the fact that Asian professionals show a similar level of power distance as the Mexican laborers. Underwood [26] indicates that respect for ranks has a strong influence on the behavior of the Korean people. This behavior is not too strong in Mexican people. Factors such as the openness of the culture to foreign influences (such as U.S. and Europe) have evolved the social ranks to more equal levels. Thus, even though the pre-Columbian cultures had extremely rigid traditions concerning the respect of ranks, these traditions have evolved in recent centuries to more equal behaviors.

In the case of Korea, the relative isolation from other cultures allows for better preservation of traditional behaviors, besides segregation from foreign cultures, and resistance to invasion and cultural cohesion (Underwood [26]). One of the noticeable results of figure 5.1 is that the UNC index shows a high level for the Germanic language group. One of the important components of Germanic cultures is their ability to adapt to unexpected situations. Asian and Germanic PDI averages are similar; the expected results, according to the findings of Hofstede, are that the Asian countries show higher levels of UNC index than Germanic professionals. It can be noticed that the Asian professionals show a similar average to that of the Mexican laborer. On the other hand, Mexican professionals show similar levels to the Western Germanic group. In order to determine which cultural dimensions have similar levels in the language groups of the

study, a statistical test was conducted. The four cultural dimensions were evaluated with the Kruskal-Wallis test from Minitab <sup>TM</sup>, and ANOVA was used to evaluate the samples. Table C.2 indicates the results for the ANOVA and Kruskal-Wallis test for the PDI of the four language groups from the sample. At a level of 0.05, there is statistical evidence that the PDI of the four language groups originated from the different populations. In order to determine which groups have different PDI levels, a test with the Mann-Whitney method was conducted to evaluate the following hypothesis:

Ho  $\mu$  Mexican professional sample PDI =  $\mu$  Mexican laborer PDI

Hi  $\mu$  Mexican professional sample PDI  $\neq$   $\mu$  Mexican laborer PDI

Ho  $\mu$  Mexican professional sample PDI =  $\mu$  Germanic professional PDI

Hi  $\mu$  Mexican professional sample PDI  $\neq$   $\mu$  Germanic professional PDI

Hi  $\mu$  Mexican professional sample PDI  $\neq$   $\mu$  Germanic professional PDI

Ho  $\mu$  Mexican professional sample PDI =  $\mu$  Asian professional PDI

Hi  $\mu$  Mexican professional sample PDI  $\neq$   $\mu$  Asian professional PDI

Ho  $\mu$  Germanic professional PDI =  $\mu$  Mexican laborer PDI

Hi  $\mu$  Germanic professional PDI  $\neq$   $\mu$  Mexican laborer PDI

Ho  $\mu$  Germanic professional PDI =  $\mu$  Asian professional PDI

Hi  $\mu$  Germanic professional PDI  $\neq$   $\mu$  Asian professional PDI

As was mentioned previously, the Mann-Whitney test is powerful for those data originated from non-normal distributions. The test results for survey three normality were negative; therefore, Mann-Whitney was used in conjunction with MINITAB <sup>TM</sup>. The results of the Mann-Whitney test are shown in table 5.1 and table C.3 in appendix C. From table 5.1, one can state that the Korean professionals, Mexican professionals and

the Mexican laborers share a common population origin, at least for this cultural dimension, and that there is no statistical proof that the other language group share similar population origin. According to these results, one can state that the language groups have differences in the way that they perceive their relation with authority.

According to the results of table 5.1, only Mexican and Asian language groups share a common population origin. A matrix in Table 5.2 indicates details about the test result for the PDI Tukey's test. In order to corroborate in these results, an ANOVA was conducted with the PDI data. One must state that even though the data did not originate from a normal distribution, the ANOVA considers multiple comparisons that can indicate which groups are statistically different in their means. The results of the ANOVA test are shown in table C.2 in appendix C. The test was conducted with Minitab <sup>TM</sup> and includes a Tukey's pair wise comparison. According to the ANOVA test and Tukey comparison, the Germanic and Asian groups have different population means. Table C.2 indicates a confidence interval of 0.4363 to 2.1637; it excludes 0, which is the statistical evidence that the two groups have different population means.

Table 5.1. Results for Mann- Whitney test for Power Distance Index.

Test results	Mexican professional (n1) Vs. Germanic professional (n2)	Mexican professional (n1) vs. Mexican laborer (n2)	Mexican professional (n1) vs. Asian professional (n2)	Mexican laborer (n1) vs. Germanic professional (n2)	Mexican laborer (n1) vs. Asian professional (n2)	Germanic professional (n1) vs. Asian professional (n2)
N1, n2	10,10	10,10	10,10	10,10	10,10	10,10
P-value	0.0233	0.0113	0.162	0.0010	0.3447	0.0052
P-value adjust for ties	0.0085	0.0072	0.136	0.0003	0.2977	0.0020
W-test (U)	135.5	83.0	86.00	149	118	67.5
Median (n1)	2.0	2.0	2.0	3.0	3.0	1.0
Median (n2)	1.0	3.0	2.5	1.0	2.5	2.5
Test Result	Reject Ho	Reject Ho	Retain Ho	Reject Ho	Retain Ho	Reject Ho

For Germanic professionals and Mexican laborers, the result in table 5.2 for the Tukey comparison indicates that the groups have different population means (C.I between – 2.5637 and –0.8363). The critical values, confidence intervals and the test values for the Tukey’s HSD post Hoc Test, are displayed in table C.2 for all the language groups of the PDI dimension.

Table 5.2. Results matrix table for Tukey’s test for Power Distance Index.

Power distance Index Tukey’s test results (Confidence intervals indicated*)				
	Mexican professional	Mexican laborer	Germanic professional	Asian professional
Mexican professional		0.1363 1.8637	-1.5637 0.1637	-0.2637 1.4637
Mexican laborer			-2.5637 -0.8363	-1.2637 0.4637
Germanic professional				0.4363 2.1637
Asian professional				

\*Table numbers indicate confidence intervals obtained with MINITAB (Confidence intervals that include 0 indicate non-significant differences)

In table 5.1 and table 5.2, the Germanic professional group and the Mexican laborer groups show statistically different means; therefore, it can be stated that the Mexican professional, Germanic professional and Mexican laborer groups do not have equal PDI.

The fact that the Mexican laborer and the Mexican professional have a different conception of the scope of the power image can explain many conflicts that occur among laborers and professional staff in the maquila environment. This also indicates the strong influence of education on the person’s behavior. Higher education either changes

traditional behavior or reinforces modern behavior in the Mexican population that had the opportunity to earn a college degree.

For the other three cultural dimensions (MAS, IDV and UNC), the Mexican professional sample reflects similar values to the other three language groups. In order to validate this statement, the same analysis procedure that was used for PDI was used for the other three cultural dimensions. Results can be seen in appendix C in table C.4 and table C.5 for IND, table C.6 and table C.7 for MAS and C.8 and Table C.9 for UNC, and their summary in tables' 5.1,5.3,5.4 and 5.5. As reflected in the tables, only PDI shows significant differences among the language groups; all the other cultural dimensions show that the language groups have similar cultural behaviors, or these do not differ strongly enough to be considered statistically different.

Table 5.3. Results for Mann-Whitney test for Individualism/Collectivism Index.

Test results	Mexican professional (n1) Vs. Germanic professional (n2)	Mexican professional (n1) vs. Mexican laborer (n2)	Mexican professional (n1) vs. Asian professional (n2)	Mexican laborer (n1) vs. Germanic professional (n2)	Mexican laborer (n1) vs. Asian professional (n2)	Germanic professional (n1) vs. Asian professional (n2)
n1, n2	30,30	30,30	30,30	30,30	30,30	30,30
P-value	0.6152	0.5642	0.7283	0.3112	0.7117	0.3912
P-value adjust for ties	0.6003	0.5473	0.7143	0.2901	0.6988	0.3672
W-test (U)	880.5	954.5	939.0	846	973.5	973.5
Median (n1)	2.0	2.0	2.0	2.0	2.0	2.0
Median (n2)	2.0	2.0	2.0	2.0	2.0	2.0
Test Result	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho



Table 5.4. Results for Mann-Whitney test for Masculinity/Femininity index.

Test results	Mexican professional (n1) Vs. Germanic professional (n2)	Mexican professional (n1) vs. Mexican laborer (n2)	Mexican professional (n1) vs. Asian professional (n2)	Mexican laborer (n1) vs. Germanic professional (n2)	Mexican laborer (n1) vs. Asian professional (n2)	Germanic professional (n1) vs. Asian professional (n2)
n1, n2	35,35	35,35	35,35	35,35	35,35	35,35
P-value	0.1883	0.8648	0.8188	0.1604	0.9345	0.1749
P-value adjust for ties	0.1669	0.8590	0.8126	0.1441	0.9322	0.1606
W-test (U)	1130.0	1257.5	1262.5	1122.5	1250.0	1358.5
Median (n1)	2.0	2.0	2.0	2.0	2.0	3.0
Median (n2)	3.0	2.0	2.0	3.0	2.0	2.0
Test Result	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho

Table 5.5. Results for Mann-Whitney test for Uncertainty Avoidance.

Test results	Mexican professional (n1) Vs. Germanic professional (n2)	Mexican professional (n1) vs. Mexican laborer (n2)	Mexican professional (n1) vs. Asian professional (n2)	Mexican laborer (n1) vs. Germanic professional (n2)	Mexican laborer (n1) vs. Asian professional (n2)	Germanic professional (n1) vs. Asian professional (n2)
n1, n2	20,20	20,20	20,20	20,20	20,20	20,20
P-value	0.2835	0.6456	0.2287	0.1556	0.1478	0.9246
P-value adjust for ties	0.2576	0.6316	0.2029	0.1386	0.1318	0.9202
W-test (U)	370.0	472.5	365.0	357.0	356.0	406.0
Median (n1)	2.5	2.5	2.5	2.0	2.0	3.0
Median (n2)	3.0	2.0	3.0	3.0	3.0	3.0
Test Result	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho	Retain Ho

The Tukey comparison test was applied to all the groups after the ANOVA test. The power of this test is diminished because of the non-normality of the raw data. The ANOVA and Tukey test will be used as a validation method to the Mann-Whitney multiple comparisons shown in tables 5.2, 5.6, 5.7 and 5.8

Table 5.6 Results for Tukey's test with Minitab™ for Individualism/Collectivism index.

Power distance Index Tukey's test results (Confidence intervals indicated *)				
	Mexican professional	Mexican laborer	Germanic professional	Asian professional
Mexican professional		-0.832 0.632	-0.565 0.898	-0.865 0.598
Mexican laborer			-0.465 0.998	-0.765 0.698
Germanic professional				-1.032 0.432
Asian professional				

\*Table numbers indicate confidence intervals obtained with MINITAB (Confidence intervals that include 0 indicate non-significant differences)

Table 5.7 Results for Tukey's test with Minitab™ for Masculinity/Femininity index.

Power distance Index Tukey's test results (Confidence intervals indicated*)				
	Mexican professional	Mexican laborer	Germanic professional	Asian professional
Mexican professional		-0.684 0.627	-0.313 0.998	-0.684 0.627
Mexican laborer			-0.284 1.027	-0.656 0.656
Germanic professional				-1.027 0.284
Asian professional				

\*Table numbers indicate confidence intervals obtained with MINITAB (Confidence intervals that include 0 indicate non-significant differences)

According to tables 5.2, 5.5, 5.6 and 5.7, the language groups are only statistically different on PDI. The statistical proof of this result is based on the Tukey test conducted with Minitab. According to the Minitab manual [37], those confidence intervals that do not include 0 in the interval are considered as samples gathered from different populations. Only the PDI showed this type of results. Those groups that showed statistical differences among them were the Mexican professional vs. Mexican laborer, Mexican laborers vs. Germanic professionals, and finally Germanic professional vs. Asian professionals.

## 5.2 Conclusions of chapter five.

The perception of the power distance (PD) shown by the respondents of the two Mexican groups was very different. Several factors influence the difference between the Mexican professionals and the Mexican laborers. Education methods utilized in Mexico may be one of the reasons for the different perceptions of the power distance. In earlier school levels, education is strongly paternalistic. Students are not asked to give an opinion, and education programs are more or less regulated over all of Mexico; therefore, standard programs and methods of education are followed. On the other hand, when persons access high levels of education, they are more or less economically wealthy. Developing a professional career in a prestigious or distinguished school is difficult for most of the population. A high level of competition to achieve good grades exists, and many scholarships are achieved through high grades. Furthermore, access to a prestigious school also indicates that the members of that school are highly capable or have a strong

economic income; therefore, it is an indication of higher economic status or capability from the individual.

In contrast to the North American way of thinking, for the Mexican individual, education is the path to achieving a better economic level, when for many American individuals, education is a path to achieving happiness, according to Underwood [26]. As can be noticed, the education in Mexico plays a role in influencing the cultural difference. This difference is important because different motivation programs can be established in a single facility depending on the academic level of the individuals. Mexican labor rules tend to be paternalistic and protectionist. The different education levels make the perception of certain traditions stronger. College students are taught with methods similar to those used in rich nations. Therefore, education creates a gap between the social classes. This event is almost as old as the creation of Mexico as a nation. Higher-class populations also receive Western type education or even use it to study in foreign countries, leading to the loss of many of the Mexican traditions. These facts are reinforced by the racism practiced in Mexico. As mentioned at the beginning of this thesis, the fact that a person belongs to a nation does not indicate that the population has a common cultural background. But language similarity, physical closeness, and social interaction can help with the creation of a homogenized society.

Even though the Mexican laborers and the Mexican professionals share a common language, social interaction seems to be lower than in other nations. This can explain why the perception of the power distance is different for the laborers and the Mexican professionals. On the other hand, the Asian professional shows similar PDI values as the Mexican professional. Modern Asian professionals are an uncommon mix of traditions

and development; the Mexican professional apparently has developed the same pattern. As mentioned previously, Mexican traditions and values (which dictate the individual motivation) experience a transformation to more American-like values, but even in this, the Mexican professionals do not totally show similar cultural values as the Germanic professionals. Therefore, it can be stated that the Mexican professionals and the Mexican laborers are closely related in three cultural values (MAS, IDV and UNC), but their PDI values are different, creating the possibility of cultural conflicts among the Mexican society members.

It must be considered that with the limited sample, a similar study must be conducted among social groups in other societies to determine if this is a common pattern for other cultures and that values differ (deeply) according to the social and education levels. The results indicate that professionals around the world may share more values among themselves than with other groups from their own mother countries. One possible reason for this effect is the global communications and cultural homogenization through American and European values and motivators (individual economic and social success). This cultural homogenization should be a positive trend for maquila companies. Transnational companies may be able to apply similar rewards systems for their professionals around the world, independently of the cultural background of the individuals. Those groups less influenced by the global communications and social interchange (laborers, peasants, etc.) must be rewarded based on their traditional values. A better motivation should be achieved if their real motivator and values are rewarded.

## CHAPTER 6

### CONCLUSION

Human motivation is not the result of a single factor but the result of several factors and their combinations. Cultural values, language and communication have a strong influence on the motivation of individuals in order to develop any activity. Even education level and social status have a strong influence on the perception of the environment. Language, according to the results found, is the strongest barrier to sharing information . Even if cultural groups share similar values, the impossibility to communicate them to the other social group limits the achievement of common goals. The application of rewards system in maquila enterprises must be based on the analysis of the preferences, values and needs of that particular group to be rewarded. Satisfaction for the whole group may be impossible, but the satisfaction of the majority of the group becomes possible if the demography and cultural values of the group are analyzed in advance. The application of numerical formulas to evaluate human feelings and expectations is difficult and sometimes dangerous because this can do more damage than good when a wrong decision is made. Numerical tools should be used as a support for a reward system application. The possible application of methodologies like the one developed in this thesis may also affect the economic efficiency of the facility. Highly motivated staff will affect the overall performance of a company. Human resources are the key factor to develop efficient companies and processes. This same methodology

should not be exclusively used for Maquila companies. Other types of transnational companies may apply the methodology developed in this thesis. In order to measure the capacity of the method to improve the effectiveness of the reward system, an extensive application of the method is recommended. The cultural groups analyzed show some differences in the perception of social values. In the case of the Mexican employees, a distinction among those staff members with high education levels and low education levels should be considered. The expectations in some cultural values differ much if the analyzed Mexican groups are clustered according to the education level. Different expectations and values shape these different social subgroups. More divisions or subgroup clusterings is not recommended, because analysis of the motivation will become extremely complicated and personalized. Focus on the majority of the staff groups of the maquila is recommended. Total satisfaction or motivation is not an economically feasible goal in a productive facility. Considerations also should be made about the potential loss of power of surveys because of translation from one language to another. A ratio of satisfaction is an efficient mathematical tool to estimate the satisfaction level of groups. Besides the measure, a long-term control of the satisfaction and motivation levels before and after the application of a new or improved reward system is also recommended in order to determine the efficiency of it. The application of non-parametrical tools in order to evaluate discrete data also showed enough power to determine the results of the applied surveys. Finally, in order to motivate Mexican staff in the maquiladora area, paternalistic reward systems are recommended. Asian companies have a strong possibility of applying the native rewards system without creating a cultural shock because the majority of the staff is less educated. In the case of having highly

educated staff, more individualist rewards and administration systems are recommended. In the case of Western origin companies, an in-depth study of the rewards systems should be considered in order to adapt these systems to the Mexican workers to avoid unhappiness and a possible increase in turnover. The following table can be used as a guideline to implement managerial methods in maquilas in the Mexico trade zone, according to the native culture.

Table 6.1 Recommendations matrix

Cultural group	Motivation factor						
	Management Style	Tasks difficulty	Wage level *	Recommended Non-monetary bonus	Facilities	Training	Job responsibility
Mexican Professional	Freedom	High	High	Medical assistance	Modern	Often	High
Mexican Laborer	Paternalistic	Low	Medium to high	Food coupons, transportation, assistance bonuses.	Functional	Often	Low
U.S. Professional	Freedom	High	Medium to high	Medical assistance	Modern	Often	High
Korean Professional	Paternalistic	High to Medium	Medium to high	Medical assistance	Functional	Low	High

\*Compared with local wages.



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## APPENDIX A

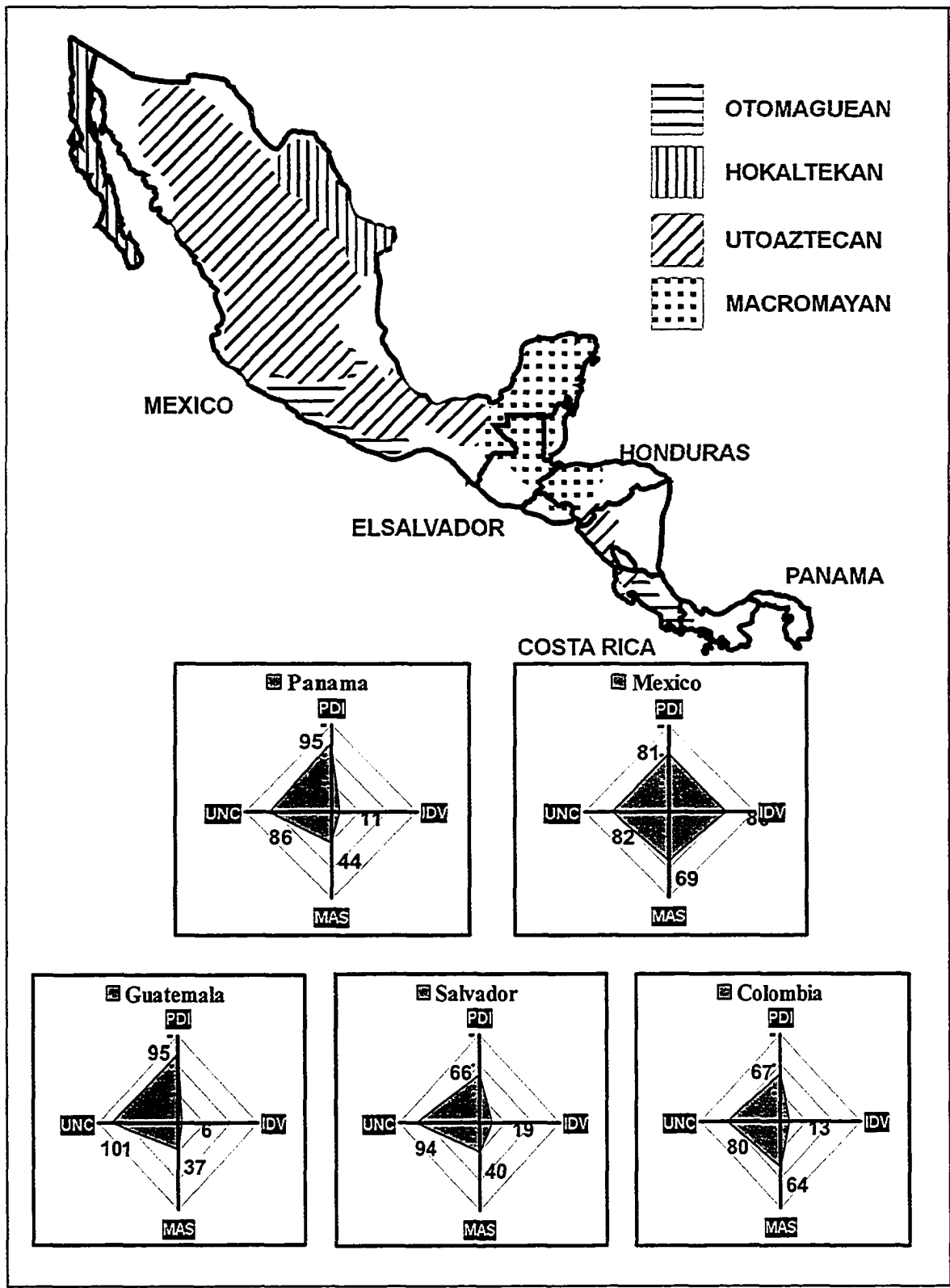


Fig. A.1 Latin Central-America countries map with cultural dimension scores

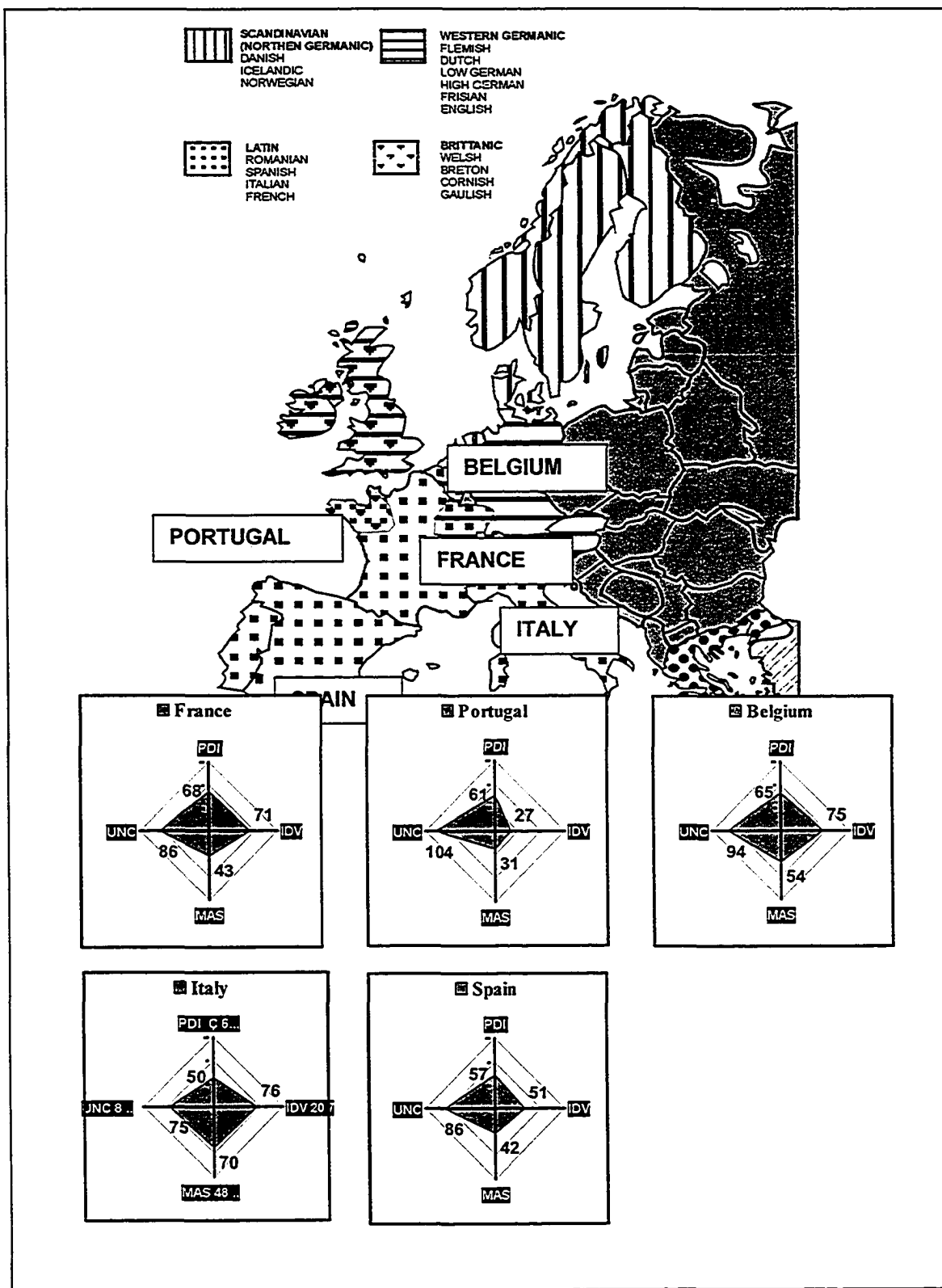


Fig. A.2 Latin European countries map with cultural dimension scores

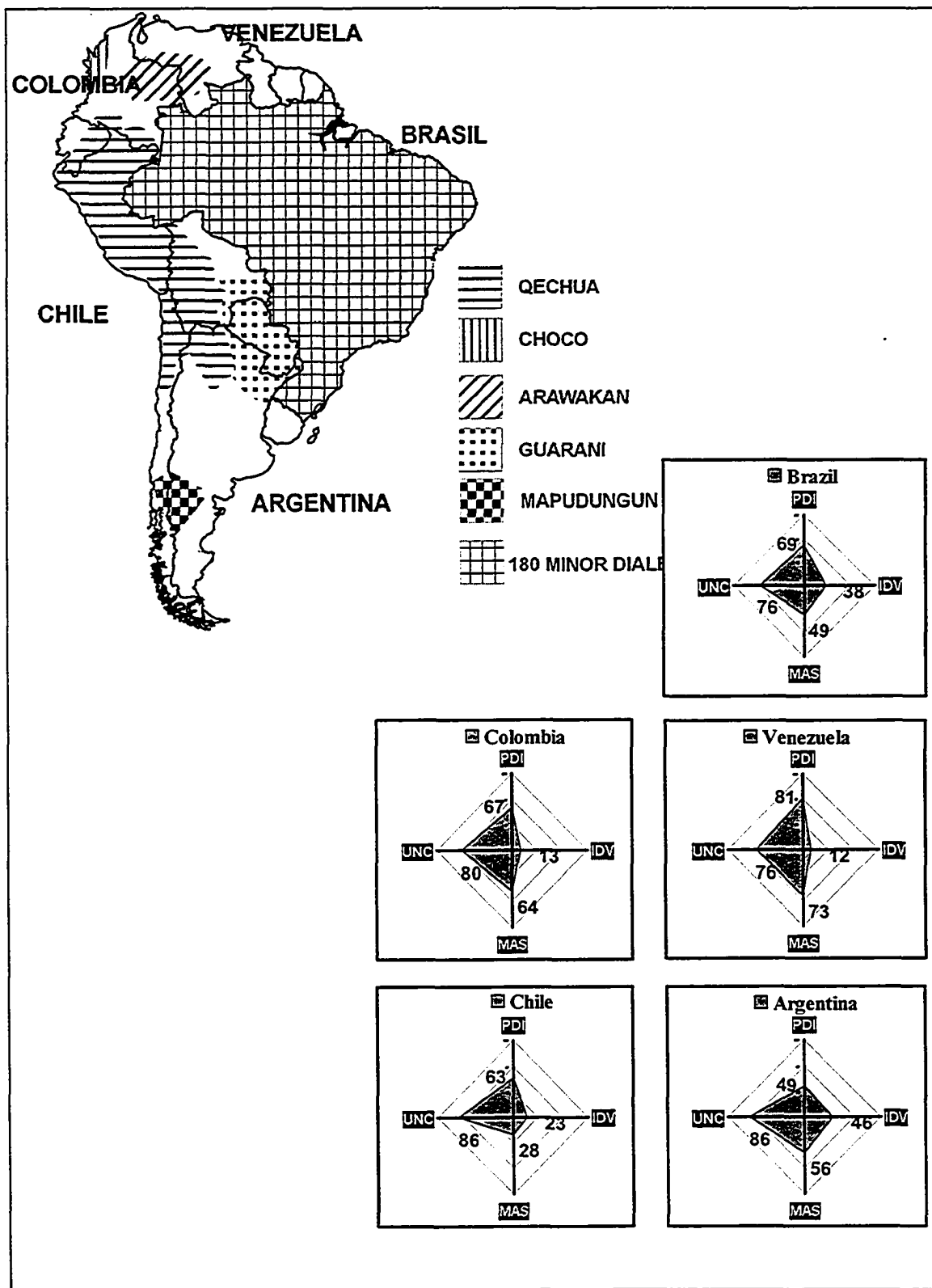


Fig. A.3 Latin South America countries map with cultural dimension scores



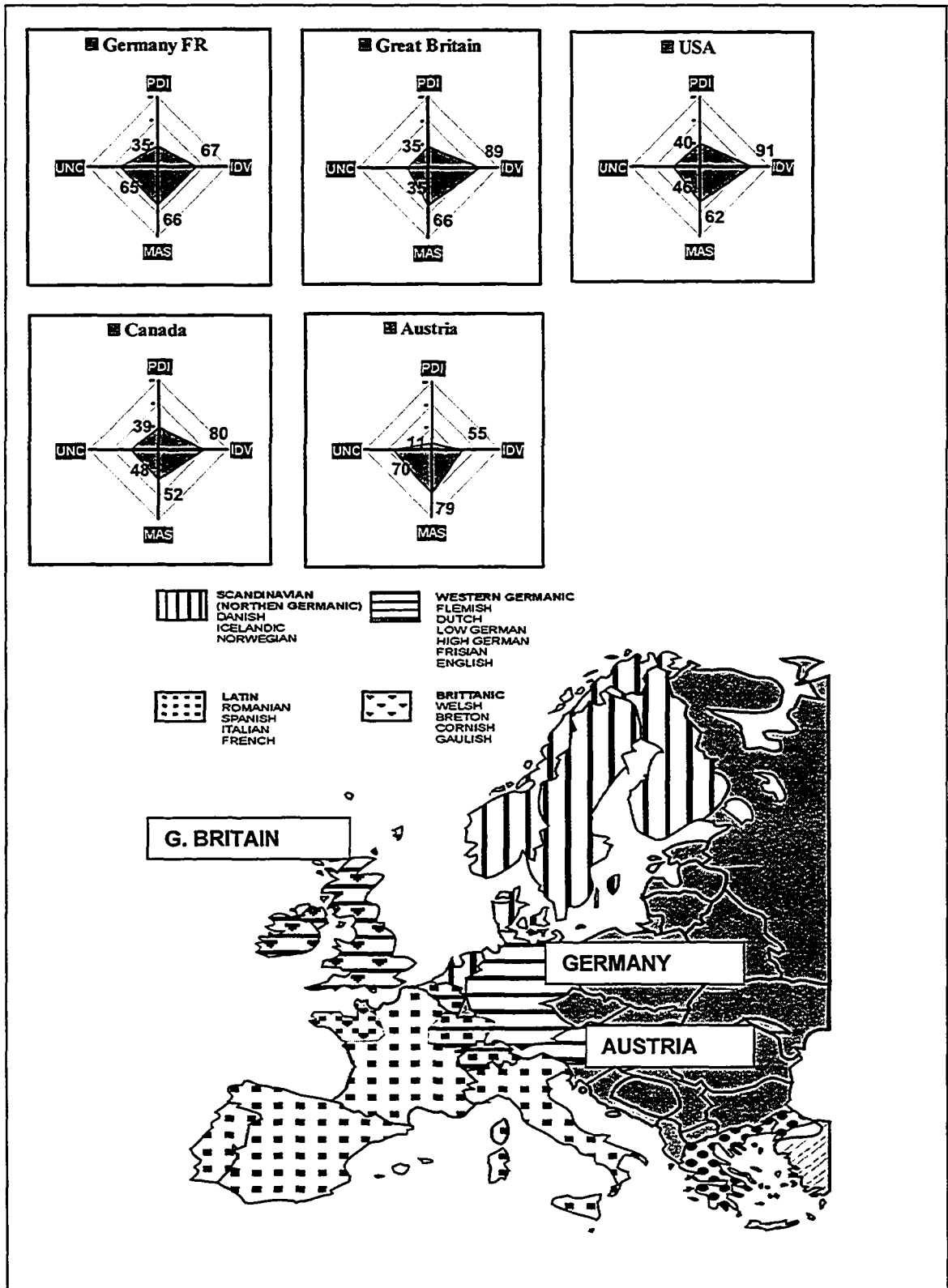


Fig. A.4 West Germanic language countries with cultural dimension scores

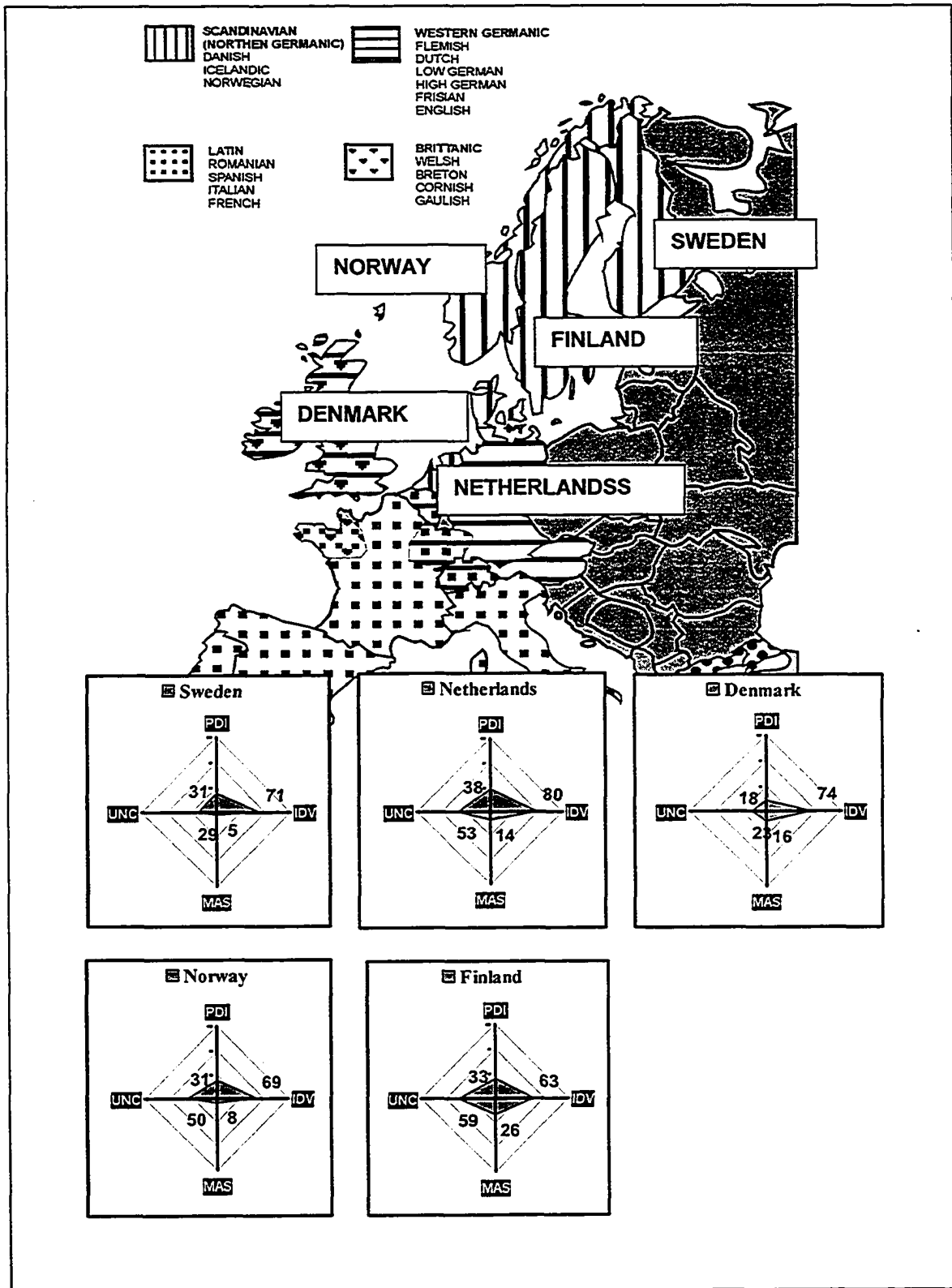


Fig. A.5 North Germanic countries map with cultural dimension scores

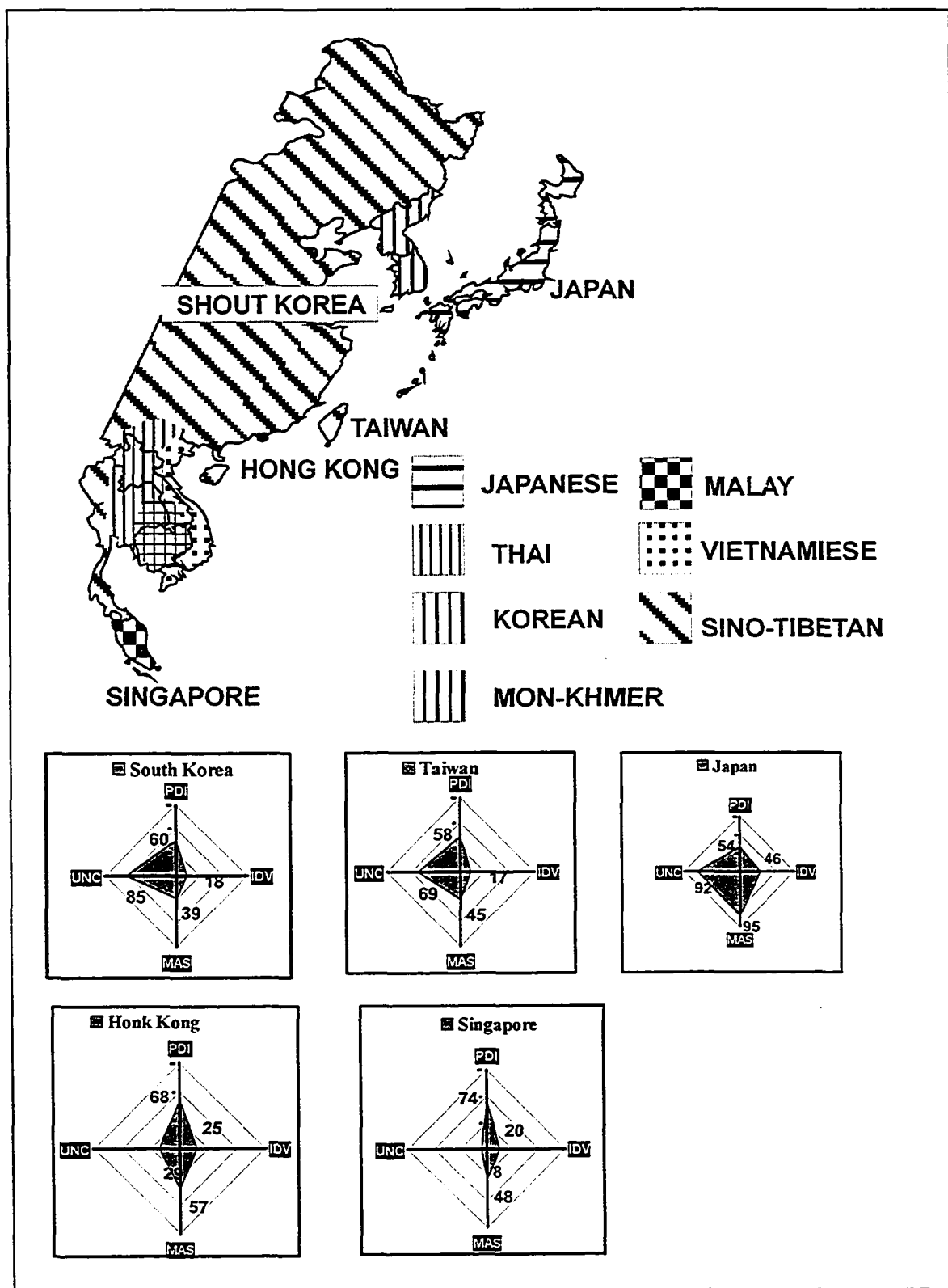


Fig. A.6 Asian countries map with cultural dimension scores

Table A.1 ANOVA results for mean of language groups (PDI, IDV, MAS).

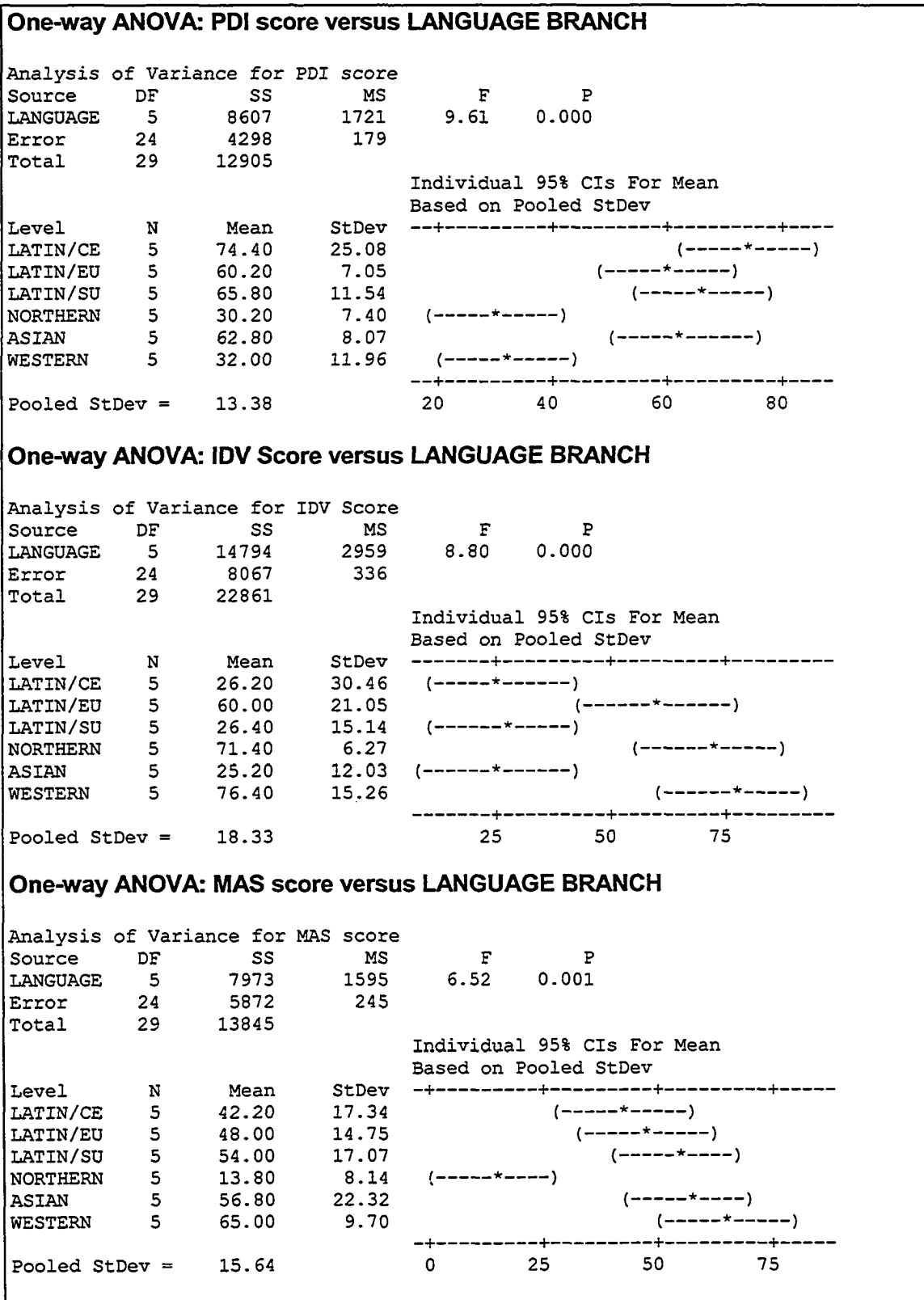


Table A.2 ANOVA results for mean of language groups (UNC).

One-way ANOVA: UNC score versus LANGUAGE BRANCH					
Analysis of Variance for UNC score					
Source	DF	SS	MS	F	P
LANGUAGE	5	10369	2074	6.25	0.001
Error	24	7966	332		
Total	29	18335			
Individual 95% CIs For Mean					
Based on Pooled StDev					
Level	N	Mean	StDev	-----+-----+-----+-----	
LATIN/CE	5	89.80	7.63		(-----*-----)
LATIN/EU	5	89.00	10.77		(-----*-----)
LATIN/SU	5	80.80	5.02		(-----*-----)
NORTHERN	5	42.80	15.82	(-----*-----)	
ASIAN	5	56.60	36.53	(-----*-----)	
WESTERN	5	52.80	14.41	(-----*-----)	
-----+-----+-----+-----					
Pooled StDev =		18.22		50	75 100

## APPENDIX B

Table B.1 Survey one results

		Respondent number											Survey one statistics		
		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	Sum**	Average	Standard deviation
<b>Motivation Factor</b>	Size of company	10	16	14	4	17	4	17	7	19	5	8	121	11.00	5.74
	Financial Security (Retirement plans etc.)	5	9	13	11	13	14	14	11	10	14	5	119	10.82	3.34
	Job was available	18	12	11	19	18	18	16	12	14	13	18	169	15.36	3.01
	Location of work( close to relatives, city , etc.)	6	4	17	9	16	5	15	17	18	7	9	123	11.18	5.44
	Opportunity to be promoted	7	11	2	12	8	9	7	10	2	10	6	84	7.64	3.32
	Challenge of work, responsibility.	3	10	8	14	9	12	10	15	11	17	12	121	11.00	3.77
	Reputation prestige of company	11	5	16	3	11	11	14	6	17	9	1	104	9.45	5.22
	Working conditions, company policies.	14	6	7	1	1	8	8	9	9	6	7	76	6.91	3.65
	Growing organization, growing field	13	13	15	13	12	7	9	16	12	18	13	141	12.82	3.03
	Progressive research and development.	9	7	6	7	6	3	6	5	4	12	3	68	6.18	2.64
	Opportunity to learn (scholarships, training)	2	8	3	2	7	10	2	8	5	8	4	59	5.36	2.94
	Own a business	19	19	1	16	19	1	11	14	16	16	19	151	13.73	6.77
	Type of product	8	15	12	8	3	13	13	4	8	11	16	111	10.09	4.25
	Previous association with the company	17	18	9	18	14	17	19	18	13	19	17	179	16.27	3.07
	Public services, humanitarian reasons	16	14	19	17	5	19	18	13	15	15	14	165	15.00	3.90
	Opportunity to travel	15	17	18	10	15	16	12	19	6	3	11	142	12.91	5.07
	Regular increase in salary	12	3	4	6	10	15	5	2	3	4	2	66	6.00	4.38
Type of work	4	2	10	15	2	2	1	1	7	2	15	61	5.55	5.43	
Salary	1	1	5	5	4	6	3	3	1	1	10	40	3.64	2.80	

The intersection of each Motivation factor with each respondent column indicates the rank given that motivation factor by the respondent of that column with 1 being the most important factor and 19 the least important factor to achieve motivation

\*R1 means respondent 1, R2 means respondent 2.....R11 means respondent 11.

\*\* The smaller the SUM number, the more important the row factor for respondents

Table B.2 Survey one results comparison with US ranks

Comparative table of motivation rank results of Survey number one results vs. Raudsepp survey one results				
Average from survey one	Motivation Factor	US Staff Rank	Mexicans Rank	Difference
3.64	Salary	2	1	1
5.36	Opportunity to learn (scholarships, training)	10	2	8
5.55	Type of work	1	3	2
6.00	Regular increase in salary	19	4	15
6.18	Progressive research and development.	13	5	8
6.91	Working conditions, company policies.	7	6	1
7.64	Opportunity to be promoted	4	7	3
9.45	Reputation prestige of company	6	8	2
10.09	Type of product	15	9	6
10.82	Financial Security (Retirement plans etc.)	9	10	1
11.00	Size of company	11	11	0
11.00	Challenge of work, responsibility.	5	12	7
11.18	Location of work( close to relatives, city , etc.)	3	13	10
12.82	Growing organization, growing field	8	14	6
12.91	Opportunity to travel	18	15	3
13.73	Own a business	14	16	2
15.00	Public services, humanitarian reasons	17	17	0
15.36	Job was available	12	18	6
16.27	Previous association with the company	16	19	3



Table B.3 Survey one results match to Maslow's motivation hierarchy.

Motivation Factor	Matching Maslow Need	Mexican Rank (RR)	Inverse of motivation factor (IE)	Motivation Factor hierarchy (MFH)
Regular increase in salary	Physiological needs	4	0.250	
Salary		1	1.000	
Own a business		16	0.063	
Job was available		18	0.056	0.342
Financial Security — (Retirement plans etc.)	Safety and security	10	0.100	
Growing organization, growing field		14	0.071	
Previous association with the company		19	0.053	0.075
Working conditions, company policies.	Love needs	6	0.167	
Location of work( close to relatives, city , etc.)		13	0.077	
Public services, humanitarian reasons		17	0.059	0.101
Size of company	Esteem needs	11	0.091	
Opportunity to be promoted		7	0.143	
Reputation prestige of company		8	0.125	
Type of product		9	0.111	
Opportunity to travel		15	0.067	0.107
Challenge of work, responsibility.	Self actualization	12	0.083	
Progressive research and development.		5	0.200	
Opportunity to learn (scholarships, training)		2	0.500	
Type of work		3	0.333	0.279

Table B.4 Survey number two questions one to thirteen

Question	Question description	Maximum Likert scale rate			Minimum Likert scale rate	Survey one factor measured	Question Target*
Q1	What is the perception of your current wage amount?	Excellent (1)	Fair (2)	Unfair (3)	Bad (4)	Salary	1
Q2	What is your perception of your current non-monetary bonuses?	Excellent (1)	Fair (2)	Unfair (3)	Bad (4)	Salary	1
Q3	Are you happy with your current job tasks?	Pretty happy (1)	Happy (2)	Regular (3)	Not at all (4)	Type of work	1
Q4	Your current job is what you expected, in which grade?	Excellent (1)	Fair (2)	Unfair (3)	Bad (4)	Type of work	1
Q5	What you had learned at your job is what you expected in which grade?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Opportunity to learn	1
Q6	How are the opportunities for getting training and courses?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Opportunity to learn	1
Q7	How would you rank the courses that you already receive?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Opportunity to learn	1
Q8	What is your perception of the wage increase frequency?	Excellent (1)	Fair (2)	Poor (3)	Bad (4)	Salary	1
Q9	The research and technical develop in your current company covers your expectations?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Progressive research and development	1
Q10	How would you rank your relation with the company management?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Working conditions, company policies.	1
Q11	The opportunities to be promoted are?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Opportunity to be promoted	1
Q12	How would you consider the reputation of your current company?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Reputation prestige of company	1
Q13	How would you rank your interest in your company products?	Very interesting (1)	Interesting (2)	Regular (3)	Not interesting (4)	Type of product	1

\*One is the best, and 4 is the worst

Table B.5 Survey number two questions fourteen to twenty-five

Question	Question description	Maximum likert scale			Minimum likert scale	Survey one factor measured	Question Target*
Q14	The type of products of your company have some influence on you to join to it?	Much influence (1)	Some (2)	Little (3)	None (4)	Type of product	1
Q15	The life insurance and health plans of your company are?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Safety and security	1
Q16	The size of the company, how much does it influence you to join to it?	Much influence (1)	Some (2)	Little (3)	None (4)	Size of company	1
Q17	What is your opinion of your decisions influence in the company?	Much influence (1)	Some (2)	Little (3)	None (4)	Challenge of work, responsibility.	1
Q18	Would you like to have more responsibility within the company?	A lot (1)	I would like	Regular (3)	No I don't (4)	Challenge of work, responsibility	1
Q19	The location of your workplace is conveniently located according to your other needs?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Location of work	1
Q20	The future growth of your company seems to you?	Excellent (1)	Good (2)	Regular (3)	Bad (4)	Reputation prestige of company	1
Q21	The opportunities to do job related trips in your company are?	Excellent (1)	Fair (2)	Poor (3)	Bad (4)	Opportunity to travel	1
Q22	Does your work have a strong influence, to develop your own company in the	A lot (1)	Not much (2)	Regular (3)	Not at all (4)	Challenge of work, responsibility	1
Q23	Does your professional task in this company cover some need to help others, and/or the society?	A lot (1)	Not much (2)	Regular (3)	Not at all (4)	Public services, humanitarian reasons	1
Q24	Do you work only to cover your economic needs, is this had a strong influence to accept your job?	A lot (1)	Not much (2)	Regular (3)	Not at all (4)	Job was available	1
Q25	Do you accept your current job influenced by a previous nexus with the company?	A lot (1)	Not much (2)	Regular (3)	Not at all (4)	Previous relationship with company	1

\*One is the best, and 4 is the worst

Table B.6 Survey two results

		SURVEY 2 RESULTS																										
Question main factor description	Question #	Q18	Q24	Q3	Q17	Q22	Q13	Q14	Q25	Q20	Q5	Q4	Q12	Q16	Q10	Q2	Q15	Q19	Q1	Q7	Q9	Q11	Q6	Q21	Q25	Q8		
Power in company	1	3	1	2	2	2	2	1	2	2	2	2	2	2	3	3	3	2	3	3	3	4	3	3	3	2	4	
Economic needs	2	1	2	2	2	3	2	2	2	2	2	1	2	3	3	3	2	3	3	3	4	2	3	3	3	3	3	
Job satisfaction	3	1	2	1	2	3	1	1	3	1	2	1	2	1	3	3	3	4	3	4	3	4	3	1	4	4	3	
Decision making	4	3	1	1	1	2	1	1	1	2	1	1	2	2	3	3	1	4	2	2	2	1	4	4	4	4	4	
Self achievement	5	1	2	2	3	1	2	2	3	2	2	3	3	4	2	4	4	3	3	4	4	4	4	4	4	4	4	
Motivated by company branch	6	1	2	1	3	2	2	3	2	3	3	2	2	3	2	3	3	2	2	4	3	3	4	4	4	4	4	
Motivated by company product type	7	1	2	2	3	1	2	2	1	2	3	3	2	2	3	2	3	3	3	3	3	4	4	4	4	4	2	
Love esteem needs	8	1	2	3	2	1	2	2	1	2	4	3	3	2	3	2	3	2	3	3	3	4	3	4	4	4	1	4
Company future grow	9	2	2	2	2	2	3	2	2	4	3	1	2	2	2	4	2	2	3	3	3	3	4	3	2	4	3	
Learning expectations/needs	10	1	1	2	2	2	3	2	2	3	1	3	3	2	2	2	4	3	3	4	1	2	3	3	2	4	4	
Type of work develop	11	2	2	3	3	3	3	2	2	3	3	3	3	1	3	3	2	3	3	3	3	3	3	3	3	3	3	
Company status	12	1	2	3	1	2	2	4	4	1	3	3	3	4	3	4	3	3	3	3	4	4	4	4	4	4	4	
Company size (employees quantity)	13	2	2	1	3	2	2	1	2	3	2	2	3	2	3	3	4	3	3	3	4	4	3	3	3	4	4	
Relation with the company management	14	1	4	3	2	1	2	4	2	2	2	3	2	3	2	3	3	2	4	2	2	2	2	3	3	2	2	
Economic bonus (food coupons, etc.)	15	1	1	3	2	3	2	3	2	4	2	3	3	3	3	2	3	2	2	3	3	3	3	2	3	4	3	
Medical insurance	16	1	1	2	2	1	3	4	1	1	2	2	3	4	3	3	4	2	3	3	3	3	4	4	4	4	1	3
Company location	17	1	1	3	2	4	4	2	3	4	3	3	3	2	3	3	3	2	2	2	2	4	4	4	4	4	4	2
Economic income	19	2	1	3	3	1	3	3	1	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2	3
Economic income	20	1	1	2	3	1	3	4	1	2	2	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	4	3
Economic income	21	2	2	2	3	4	2	2	4	3	3	3	3	3	3	2	3	2	3	2	3	2	3	2	3	3	3	3
Economic income	22	1	2	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	2	3	2	2	2	2	2	1	1	3
Economic income	23	1	3	2	1	2	2	2	1	2	2	2	2	1	3	2	2	2	2	3	2	2	2	4	1	1	1	2
Economic income	24	2	2	1	1	1	2	1	3	1	2	2	2	1	2	2	2	3	2	4	3	1	3	2	2	4	3	3
Economic income	25	1	3	2	1	1	1	1	2	1	3	3	1	3	2	1	2	2	2	3	2	2	1	1	1	4	3	3
Economic income	26	1	2	2	1	2	3	2	3	2	1	2	2	2	2	1	2	2	1	1	3	3	2	2	2	2	2	2
Economic income	27	1	2	2	2	2	2	1	3	2	2	2	2	3	3	2	2	2	3	3	3	4	4	4	2	3	3	3
Economic income	28	2	2	1	2	2	2	2	2	2	2	2	1	2	3	3	2	2	3	3	2	2	2	3	3	3	3	3
Economic income	29	1	2	2	2	2	3	3	3	2	2	2	2	1	2	2	4	3	3	2	2	2	1	2	2	4	4	4
Sum of responses (RS)	39	55	58	59	59	62	63	63	64	65	67	72	72	74	75	77	77	78	83	84	85	87	87	89	90			
Target (T)	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29			
Difference from target (DT)	10	26	29	30	30	33	34	34	35	36	38	43	43	45	46	48	48	49	54	55	56	58	58	60	61			
Ratio of Satisfaction (RS)	0.74	0.53	0.50	0.49	0.49	0.47	0.46	0.46	0.45	0.45	0.43	0.40	0.40	0.39	0.39	0.38	0.38	0.37	0.35	0.35	0.34	0.33	0.33	0.33	0.32			

\*The larger the RS (Ratio of satisfaction) the better.

Table B.7 Survey two results for LG staff members

		SURVEY 2 RESULTS (LG staff)																									
Question #		Q18	Q24	Q3	Q22	Q13	Q23	Q17	Q5	Q14	Q20	Q4	Q16	Q12	Q10	Q19	Q2	Q15	Q1	Q7	Q9	Q11	Q25	Q6	Q8	Q21	
	Power in company	1	3	1	2	2	2	2	2	1	2	2	2	3	3	2	3	3	3	3	3	3	3	2	3	4	3
	Economic needs	1	2	2	3	2	3	2	2	2	2	1	3	2	3	3	3	3	2	3	4	2	3	3	3	3	3
	Job satisfaction	1	2	2	3	2	3	2	2	2	2	1	3	2	3	4	3	3	3	3	3	3	3	3	3	3	3
	Self achievement	1	2	1	3	1	3	2	2	1	1	1	1	2	2	3	3	2	3	3	4	3	4	4	4	4	4
	Motivated by company branch	3	1	2	1	2	1	1	1	1	1	2	1	2	3	4	3	4	4	3	1	2	2	1	4	4	4
	Love esteem needs	1	2	2	1	2	2	3	3	3	3	2	3	2	2	3	2	2	2	4	3	4	4	4	4	4	4
	Decision making	1	2	2	1	2	2	1	3	3	3	2	3	3	3	3	2	3	3	3	4	3	4	4	4	4	4
	Learning expectations/needs	1	2	2	1	2	2	2	4	2	2	2	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3
	Motivated by company product type	2	2	3	2	2	4	2	1	2	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2
	Company future grow	1	1	2	2	3	2	2	1	2	2	3	3	2	2	3	3	2	3	4	1	2	3	4	2	4	3
	Type of work develop	2	2	3	3	2	4	1	3	4	1	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	4
	Company size (employees quantity)	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Company status	2	2	3	3	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Relation with the company management	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Company location	1	2	2	3	2	2	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Economic bonus (food coupons, etc.)	1	2	2	3	2	2	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Medical insurance	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Economic income	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Training quality	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Tecnology development	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Promotion oportunities	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Previous relation to company	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Oportunity to study/ receive training	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Increase periodicity	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Oportunity to travel by the company	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Sum of responses (RS)	29	37	45	45	46	46	48	49	50	50	51	53	56	57	57	59	59	62	62	65	67	67	68	68	73	
	Target (T)	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
	Difference from target (DT)	8	16	24	24	25	25	27	28	29	29	30	32	35	36	36	38	38	41	41	44	46	46	47	47	52	
	Ratio of Satisfaction (RS)	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	

\*The larger the RS (Ratio of satisfaction) the better.

Table B.8 Survey two results for EX-LG staff members

		SURVEY 2 RESULTS (ex-LG staff)																																					
Question #	Results	Respondent number																																					
		R1	R2	R3	R4	R5	R6	R7	R8	Sum of responses (RS)	Target (T)	Difference from target (DT)	Ratio of Satisfaction (RS)	Q18	Q17	Q3	Q14	Q22	Q20	Q21	Q13	Q5	Q4	Q12	Q2	Q1	Q23	Q10	Q24	Q15	Q11	Q16	Q9	Q6	Q19	Q7	Q25	Q8	
	Power in company	1	1	1	1	1	1	1	1	10	8	2	0.80	018	017	03	014	022	020	021	013	05	04	012	02	01	023	010	024	015	011	016	09	06	019	07	025	08	
	Decision making	1	1	1	1	1	1	1	1	11	8	3	0.73																										
	Job satisfaction	1	1	1	1	1	1	1	1	13	8	5	0.82																										
	Motivated by company product type	1	1	1	1	1	1	1	1	13	8	5	0.82																										
	Self achievement	1	1	1	1	1	1	1	1	14	8	6	0.57																										
	Company future grow	1	1	1	1	1	1	1	1	14	8	6	0.57																										
	Opportunity to travel by the company	1	1	1	1	1	1	1	1	14	8	6	0.57																										
	Motivated by company branch	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Learning expectations/needs	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Type of work develop	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Company status	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Economic bonus (food coupons, etc.)	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Economic income	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Love esteem needs	1	1	1	1	1	1	1	1	16	8	8	0.50																										
	Relation with the company management	1	1	1	1	1	1	1	1	17	8	9	0.47																										
	Economic needs	1	1	1	1	1	1	1	1	17	8	9	0.47																										
	Medical insurance	1	1	1	1	1	1	1	1	18	8	10	0.44																										
	Promotion opportunities	1	1	1	1	1	1	1	1	18	8	10	0.44																										
	Company size (employees quantity)	1	1	1	1	1	1	1	1	18	8	10	0.44																										
	Tecnology development	1	1	1	1	1	1	1	1	19	8	11	0.42																										
	Opportunity to study/ receive training	1	1	1	1	1	1	1	1	19	8	11	0.42																										
	Company location	1	1	1	1	1	1	1	1	19	8	11	0.42																										
	Training quality	1	1	1	1	1	1	1	1	20	8	12	0.40																										
	Previous relation to company	1	1	1	1	1	1	1	1	21	8	13	0.38																										
	Increase periodicity	1	1	1	1	1	1	1	1	22	8	14	0.36																										

\*The larger the RS (Ratio of satisfaction) the better.

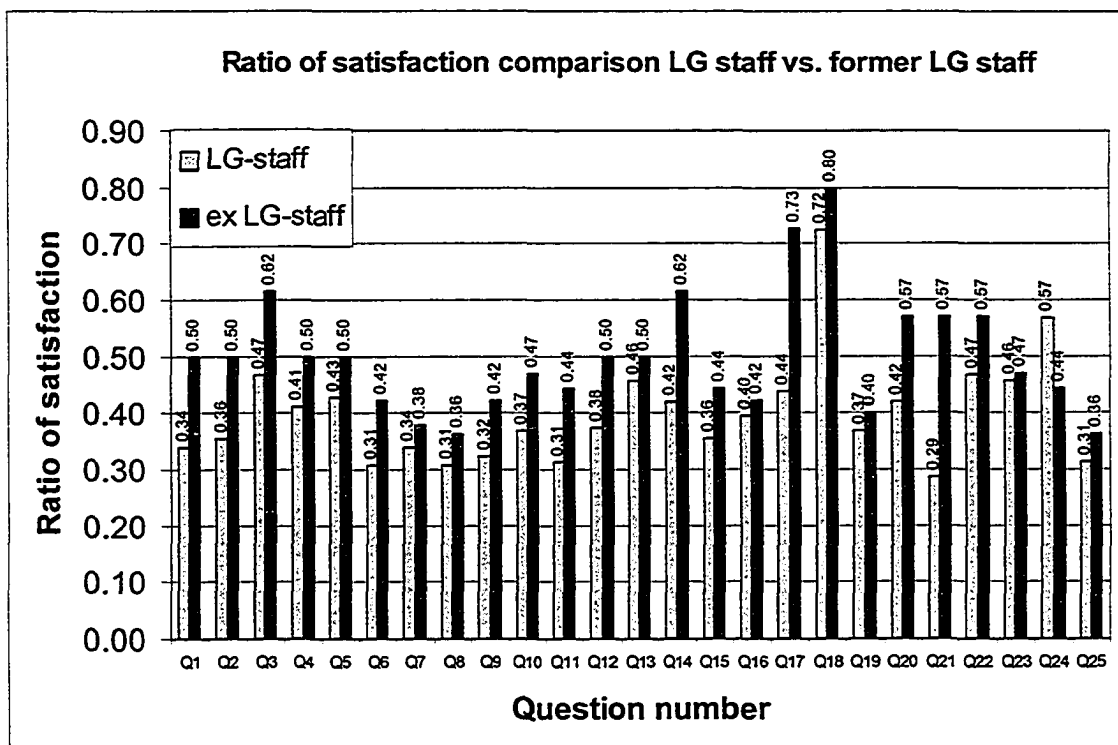


Fig. B. 1 Ratio of satisfaction comparison, LG staff vs. former LG staff.

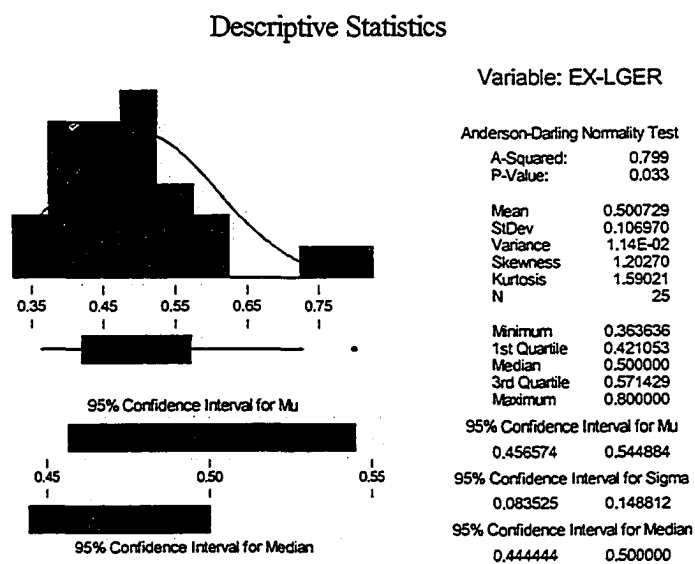


Fig. B.2 Descriptive statistics for results of survey two for former LG staff

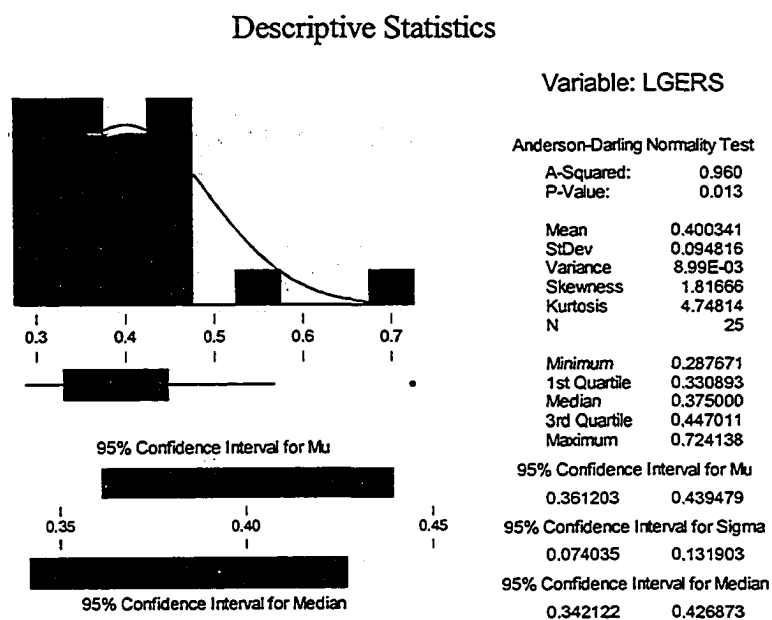


Fig. B.3 Descriptive statistics for results of survey two for LG staff



Table B.9 Mann-Whitney test results for survey two, per question

Question	n1	n2	LG staff Median (n1)	Former LG staff Median (n2)	P-value	P- value (adjusted for ties)	U value	Test Result
Q1	21	8	3	2	0.032	0.011	376.0	Reject Ho
Q2	21	8	3	2	0.0299	0.0189	360.0	Reject Ho
Q3	21	8	2	2	0.130	0.104	346.0	Retain Ho
Q4	21	8	3	2	0.134	0.098	346.5	Retain Ho
Q5	21	8	2	2	0.083	0.067	351.0	Retain Ho
Q6	21	8	3	2	0.083	0.067	351.0	Retain Ho
Q7	21	8	3	3	0.420	0.381	332.0	Retain Ho
Q8	21	8	3	3	0.143	0.113	345.5	Retain Ho
Q9	21	8	3	2	0.031	0.02	359.5	Reject Ho
Q10	21	8	3	2	0.097	0.052	349.5	Retain Ho
Q11	21	8	3	2	0.0147	0.009	365.5	Reject Ho
Q12	21	8	3	2	0.018	0.007	364.5	Reject Ho
Q13	21	8	2	2	0.643	0.592	325.0	Retain Ho
Q14	21	8	2	1.5	0.08	0.072	350.5	Retain Ho
Q15	21	8	3	2	0.053	0.037	355.5	Retain Ho
Q16	21	8	2	2	0.732	0.719	322.5	Retain Ho
Q17	21	8	2	1	0.006	0.031	371.5	Reject Ho
Q18	21	8	1	1	0.714	0.650	323.0	Retain Ho
Q19	21	8	3	2.5	0.5747	0.535	327.0	Retain Ho
Q20	21	8	2	2	0.083	0.059	351.0	Retain Ho
Q21	21	8	4	2	0.003	0.001	389.0	Retain Ho
Q22	21	8	2	2	0.406	0.383	332.0	Retain Ho
Q23	21	8	2	2	1.0	1.0	315.0	Retain Ho
Q24	21	8	2	2	0.083	0.049	279.0	Reject Ho
Q25	21	8	4	3	0.393	0.354	333.0	Retain Ho

## APPENDIX C

Table C.1 Result of the survey three

Survey Three Results																				
Respondent Group and ID		Question number																		
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
Western Germanic 1		1	1	4	1	4	2	2	1	3	3	4	3	2	1	2	4	2	3	2
Western Germanic 2		1	1	2	3	4	2	1	1	4	3	4	4	2	4	4	4	2	3	2
Western Germanic 3		1	1	4	1	4	2	2	1	3	3	4	3	2	1	2	4	2	3	2
Western Germanic 4		1	1	4	2	4	2	3	1	2	2	2	4	1	2	4	3	2	4	3
Western Germanic 5		1	2	4	3	3	2	2	2	3	2	2	4	2	2	2	4	2	3	4
Asian 1		4	1	4	2	3	2	3	1	2	1	2	4	1	1	1	4	2	2	2
Asian 2		3	3	3	2	2	2	2	2	3	3	3	1	3	1	2	3	3	1	
Asian 3		2	2	3	3	3	1	2	1	2	4	2	4	1	1	2	3	2	3	3
Asian 4		3	3	2	2	4	1	2	2	3	3	4	4	1	1	1	3	4	3	4
Asian 5		1	2	3	1	2	2	1	1	3	4	4	4	1	1	4	4	3	4	3
Mexican laborer 1		3	3	4	1	1	1	4	2	3	3	3	2	2	1	4	3	2	3	2
Mexican laborer 2		4	2	4	1	1	1	4	1	1	4	1	4	2	3	2	4	4	4	1
Mexican laborer 3		3	3	3	3	1	1	4	2	1	1	2	4	1	3	2	3	2	1	1
Mexican laborer 4		3	1	4	1	1	2	2	2	2	3	2	2	1	3	4	4	2	3	2
Mexican laborer 5		3	3	4	2	1	4	1	2	3	4	2	3	1	1	2	3	2	1	1
Mexican professional 1		1	3	4	3	4	1	1	2	4	3	4	3	1	1	2	4	2	2	1
Mexican professional 2		2	1	4	3	2	1	1	1	3	2	3	3	2	1	2	3	2	3	2
Mexican professional 3		1	2	4	2	3	2	1	1	3	2	2	2	1	2	2	3	1	2	3
Mexican professional 4		2	2	4	2	3	2	2	2	4	1	2	2	2	2	2	3	2	3	3
Mexican professional 5		2	2	2	3	3	1	2	2	3	3	3	4	3	3	1	4	2	4	2
		Power Distance questions 1 to 2		Collectivism/ Individualism questions 3 to 8					Masculinity/ Femininity questions 9 to 15					Uncertainty questions 16 to 19						

Table C.2 Kruskal-Wallis and ANOVA test for the Power Distance Index.

**Evaluated hypothesis**  
 $H_0$  PDI Mexican professionals = PDI Mexican laborers = PDI Germanic professionals = PDI Asian professionals.  
 $H_1$  some PDI mean is different between Mexican professionals, Mexican laborers, Germanic professionals, Asian professionals

**Kruskal-Wallis on Power Distance**

Language	N	Median	Ave Rank	Z
Asian	10	2.500	24.9	1.36
Germanic	10	1.000	9.3	-3.50
Mexican operator	10	3.000	29.6	2.84
Mexican professional	10	2.000	18.3	-0.70
Overall	40		20.5	

H = 16.99 DF = 3 P = 0.001  
H = 18.88 DF = 3 P = 0.000 (adjusted for ties)

**One-way ANOVA: Power Distance Index versus Language group**  
Analysis of Variance for Response

Source	DF	SS	MS	F	P
Language	3	16.475	5.492	10.69	0.000
Error	36	18.500	0.514		
Total	39	34.975			

Individual 95% CIs For Mean  
Based on Pooled StDev

Level	N	Mean	StDev
Asian	10	2.4000	0.9661
Germanic	10	1.1000	0.3162
Mexican_	10	2.8000	0.7888
Mexican_	10	1.8000	0.6325

Pooled StDev = 0.7169

Tukey's pair wise comparisons

Family error rate = 0.0500  
Individual error rate = 0.0107

Critical value = 3.81

Intervals for (column level mean) - (row level mean)

	Asian	Germanic	Mexican_
Germanic	0.4363 2.1637		
Mexican_	-1.2637	-2.5637	
Mexican_	0.4637	-0.8363	
Mexican_	-0.2637	-1.5637	0.1363
	1.4637	0.1637	1.8637

Table C.3 Mann-Whitney tests for the Power Distance Index.

**Mann-Whitney Test and CI: Mexican professional, Mexican laborer**

Mexican\_ N = 10 Median = 2.000  
 Mexican\_ N = 10 Median = 3.000  
 Point estimate for ETA1-ETA2 is -1.000  
 95.5 Percent CI for ETA1-ETA2 is (-2.000,-0.000)  
 W = 71.0  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.0113  
 The test is significant at 0.0072 (adjusted for ties)

**Mann-Whitney Test and CI: Mexican professional, Germanic**

Mexican\_ N = 10 Median = 2.0000  
 Germanic N = 10 Median = 1.0000  
 Point estimate for ETA1-ETA2 is 1.0000  
 95.5 Percent CI for ETA1-ETA2 is (-0.0001,0.9997)  
 W = 135.5  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.0233  
 The test is significant at 0.0085 (adjusted for ties)

**Mann-Whitney Test and CI: Mexican professional, Asian**

Mexican\_ N = 10 Median = 2.000  
 Asian N = 10 Median = 2.500  
 Point estimate for ETA1-ETA2 is -1.000  
 95.5 Percent CI for ETA1-ETA2 is (-1.000,0.000)  
 W = 86.0  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.1620  
 The test is significant at 0.1360 (adjusted for ties)

Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican laborer, Germanic**

Mexican\_ N = 10 Median = 3.000  
 Germanic N = 10 Median = 1.000  
 Point estimate for ETA1-ETA2 is 2.000  
 95.5 Percent CI for ETA1-ETA2 is (1.000,2.000)  
 W = 149.0  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.0010  
 The test is significant at 0.0003 (adjusted for ties)

**Mann-Whitney Test and CI: Mexican laborer, Asian**

Mexican\_ N = 10 Median = 3.000  
 Asian N = 10 Median = 2.500  
 Point estimate for ETA1-ETA2 is -0.000  
 95.5 Percent CI for ETA1-ETA2 is (0.000,1.000)  
 W = 118.0  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.3447  
 The test is significant at 0.2977 (adjusted for ties)

Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Germanic, Asian**

Germanic N = 10 Median = 1.000  
 Asian N = 10 Median = 2.500  
 Point estimate for ETA1-ETA2 is -1.000  
 95.5 Percent CI for ETA1-ETA2 is (-2.000,-1.000)  
 W = 67.5  
 Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.0052  
 The test is significant at 0.0020 (adjusted for ties)

Table C.4 Kruskal-Wallis and ANOVA test for the Individualism Index.

**Evaluated hypothesis**

Ho IND Mexican professionals= IND Mexican laborers = IND Germanic professionals=IND Asian professionals.

Hi some IND mean is different between Mexican professionals, Mexican laborers, Germanic professionals, and Asian professionals

**Kruskal-Wallis Test: Individualism value versus Language Group**

Kruskal-Wallis Test on Response

Language	N	Median	Ave Rank	Z
Asian	30	2.000	58.6	-0.35
Germanic	30	2.000	65.9	0.98
Mexican_	30	2.000	56.0	-0.81
Mexican_	30	2.000	61.5	0.18
Overall	120		60.5	

H = 1.33 DF = 3 P = 0.722

H = 1.45 DF = 3 P = 0.694 (adjusted for ties)

**One-way ANOVA: Response value versus Cultural Group**

Analysis of Variance for Response

Source	DF	SS	MS	F	P
Cultural	3	1.63	0.54	0.46	0.710
Error	116	136.87	1.18		
Total	119	138.50			

Individual 95% CIs For Mean  
Based on Pooled StDev

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev			
Asian	30	2.133	0.860	-----+-----+-----+-----+-----			
Germanic	30	2.433	1.135	(------*-----)			
Mexican_	30	2.167	1.262	(------*-----)			
Mexican_	30	2.267	1.048	(------*-----)			
Pooled StDev = 1.086				1.80	2.10	2.40	2.70

Tukey's pair wise comparisons

Family error rate = 0.0500

Individual error rate = 0.0103

Critical value = 3.69

Intervals for (column level mean) - (row level mean)

	Asian	Germanic	Mexican_
Germanic	-1.032 0.432		
Mexican_	-0.765 0.698	-0.465 0.998	
Mexican_	-0.865 0.598	-0.565 0.898	-0.832 0.632

Table C.5 Mann-Whitney tests for the Individualism Index.

**Mann-Whitney Test and CI: Mexican professional, Mexican laborer**

Mexican\_ N = 30 Median = 2.000  
 Mexican\_ N = 30 Median = 2.000  
 Point estimate for ETA1-ETA2 is 0.000  
 95.2 Percent CI for ETA1-ETA2 is (0.000,1.000)  
 W = 954.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.5642  
 The test is significant at 0.5473 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Germanic**

Mexican\_ N = 30 Median = 2.000  
 Germanic N = 30 Median = 2.000  
 Point estimate for ETA1-ETA2 is 0.000  
 95.2 Percent CI for ETA1-ETA2 is (-1.000,0.000)  
 W = 880.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.6152  
 The test is significant at 0.6003 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Asian**

Mexican\_ N = 30 Median = 2.0000  
 Asian N = 30 Median = 2.0000  
 Point estimate for ETA1-ETA2 is 0.0000  
 95.2 Percent CI for ETA1-ETA2 is (0.0000,1.0003)  
 W = 939.0  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7283  
 The test is significant at 0.7143 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican laborer, Germanic**

Mexican\_ N = 30 Median = 2.000  
 Germanic N = 30 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.2 Percent CI for ETA1-ETA2 is (-1.000,-0.000)  
 W = 846.0  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3112  
 The test is significant at 0.2901 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican laborer, Asian**

Mexican\_ N = 30 Median = 2.000  
 Asian N = 30 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.2 Percent CI for ETA1-ETA2 is (-1.000,0.000)  
 W = 889.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.7117  
 The test is significant at 0.6988 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Germanic, Asian**

Germanic N = 30 Median = 2.0000  
 Asian N = 30 Median = 2.0000  
 Point estimate for ETA1-ETA2 is 0.0000  
 95.2 Percent CI for ETA1-ETA2 is (0.0001,0.9998)  
 W = 973.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.3912  
 The test is significant at 0.3672 (adjusted for ties)  
 Cannot reject at alpha = 0.05





Table C.7 Mann-Whitney tests for the Masculinity Index.

**Mann-Whitney Test and CI: Mexican professional, Mexican laborer**  
 Mexican N = 35 Median = 2.0000  
 Mexican N = 35 Median = 2.0000  
 Point estimate for ETA1-ETA2 is -0.0000  
 95.0 Percent CI for ETA1-ETA2 is (-0.0000,1.0003)  
 W = 1257.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.8648  
 The test is significant at 0.8590 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Germanic**  
 Mexican N = 35 Median = 2.0000  
 Germanic N = 35 Median = 3.0000  
 Point estimate for ETA1-ETA2 is 0.0000  
 95.0 Percent CI for ETA1-ETA2 is (-0.9998,0.0002)  
 W = 1130.0  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1883  
 The test is significant at 0.1669 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Asian**  
 Mexican N = 35 Median = 2.000  
 Asian N = 35 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,1.000)  
 W = 1262.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.8188  
 The test is significant at 0.8126 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican laborer, Germanic**  
 Mexican N = 35 Median = 2.0000  
 Germanic N = 35 Median = 3.0000  
 Point estimate for ETA1-ETA2 is -0.0000  
 95.0 Percent CI for ETA1-ETA2 is (-0.9997,-0.0002)  
 W = 1122.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1604  
 The test is significant at 0.1441 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican laborer, Asian**  
 Mexican N = 35 Median = 2.000  
 Asian N = 35 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,1.000)  
 W = 1250.0  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.9345  
 The test is significant at 0.9322 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Germanic, Asian**  
 Germanic N = 35 Median = 3.000  
 Asian N = 35 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (0.000,1.000)  
 W = 1358.5  
 Test of ETA1 = ETA2 vs ETA1 not = ETA2 is significant at 0.1749  
 The test is significant at 0.1606 (adjusted for ties)  
 Cannot reject at alpha = 0.05

Table C.8 Kruskal-Wallis and ANOVA test for the Uncertainty Avoidance Index.

**Evaluated hypothesis**

Ho UNC Mexican professionals= UNC Mexican laborers = UNC Germanic professionals=UNC Asian professionals.

**Kruskal-Wallis Test: Response value versus Cultural group**

Kruskal-Wallis Test on Response

Cultural	N	Median	Ave Rank	Z
Asian	20	3.000	45.7	1.14
Germanic	20	3.000	45.0	0.99
Mexican	20	2.000	34.3	-1.38
Mexican	20	2.500	37.1	-0.75
Overall	80		40.5	

H = 3.57 DF = 3 P = 0.311

H = 3.92 DF = 3 P = 0.270 (adjusted for ties)

**One-way ANOVA: Response value versus Cultural group**

Analysis of Variance for Response

Source	DF	SS	MS	F	P
Cultural	3	3.838	1.279	1.49	0.225
Error	76	65.350	0.860		
Total	79	69.188			

Individual 95% CIs For Mean  
Based on Pooled StDev

Level	N	Mean	StDev	CI
Asian	20	2.9000	0.8522	(-----*-----)
Germanic	20	2.9000	0.8522	(-----*-----)
Mexican	20	2.4000	1.0954	(-----*-----)
Mexican	20	2.5500	0.8870	(-----*-----)

Pooled StDev = 0.9273

2.00      2.40      2.80      3.20

Tukey's pair wise comparisons

Family error rate = 0.0500

Individual error rate = 0.0103

Critical value = 3.72

Intervals for (column level mean) - (row level mean)

	Asian	Germanic	Mexican
Germanic	-0.7713 0.7713		
Mexican	-0.2713 1.2713	-0.2713 1.2713	
Mexican	-0.4213 1.1213	-0.4213 1.1213	-0.9213 0.6213

Table C.9 Mann-Whitney tests for the Uncertainty Avoidance Index.

**Mann-Whitney Test and CI: Mexican professional, Mexican operator**

Mexican N = 20 Median = 2.500  
 Mexican N = 20 Median = 2.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,1.000)  
 W = 427.5

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.6456  
 The test is significant at 0.6316 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Germanic**

Mexican N = 20 Median = 2.500  
 Germanic N = 20 Median = 3.000  
 Point estimate for ETA1-ETA2 is 0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,-0.000)  
 W = 370.0

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.2853  
 The test is significant at 0.2576 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican professional, Asian**

Mexican N = 20 Median = 2.500  
 Asian N = 20 Median = 3.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,0.000)  
 W = 365.0

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.2287  
 The test is significant at 0.2029 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican operator, Germanic**

Mexican N = 20 Median = 2.000  
 Germanic N = 20 Median = 3.000  
 Point estimate for ETA1-ETA2 is -1.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,-0.000)  
 W = 357.0

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.1556  
 The test is significant at 0.1386 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Mexican operator, Asian**

Mexican N = 20 Median = 2.000  
 Asian N = 20 Median = 3.000  
 Point estimate for ETA1-ETA2 is -1.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,0.000)  
 W = 356.0

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.1478  
 The test is significant at 0.1318 (adjusted for ties)  
 Cannot reject at alpha = 0.05

**Mann-Whitney Test and CI: Germanic, Asian**

Germanic N = 20 Median = 3.000  
 Asian N = 20 Median = 3.000  
 Point estimate for ETA1-ETA2 is -0.000  
 95.0 Percent CI for ETA1-ETA2 is (-1.000,1.000)  
 W = 406.0

Test of ETA1 = ETA2 vs. ETA1 not = ETA2 is significant at 0.9246  
 The test is significant at 0.9202 (adjusted for ties)  
 Cannot reject at alpha = 0.05

## VITA

Daniel Reynoso Ortiz graduated from Preparatoria No. 2 in Monterrey in 1989 and obtained a Bachelor of science (BS) in Industrial Design from the Universidad Autonoma de Nuevo Leon in 1994. He was a junior designer at Maquinaria J y R for two years (1994-1996). He started his Master's in Manufacturing Engineering at UTPA in the fall of 1999. He was an automation engineer at Zenith Electronics de Reynosa from October 1996 to June 1998, and mechanical design engineer from June 1998 to October 2003. He has presented one paper titled "*Motivating and leading technical personnel in an international production environment a base study in the Mexican maquiladora industry*" at the Proceedings of the 6 th Annual International Conference on Industrial Engineering Theory, Applications and Practice, San Francisco, CA, USA, November 18-20, 2001. He worked for several six sigma projects as a black belt at LG electronics de Reynosa, Mexico. He will start his career as a design engineer with Hoffman Enclosures Co., Reynosa, Mexico from November 2003.