

Eric Sprrott Carleton University  
School  
of Business

An Investigation to Discern Organizational Subcultures:  
The Case of a Hospital Setting

By

Ari Rosberg

Thesis submitted to the Faculty of Graduate Studies and Research  
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## **ABSTRACT**

Previous research and management literature too often focused on corporate culture with little or no attention given to heterogeneous subcultures that also exist within the organization. Few empirical studies have been made of corporate subcultures. Those that exist were difficult to implement. An efficient method of identifying corporate subcultures is needed.

In this study, a questionnaire was used to observe and to profile employees' work-related values in a hospital setting. This research was designed to investigate cultures more subtle than those bounded by national or ethnic identities. The model used allows for finding subcultures not limited just to those developing around occupations.

Results show evidence of a unified corporate culture coexisting alongside distinct subcultures in the organization. Results also suggest that quantitative methods can be used to identify subgroups of employees, but that qualitative methods provide rich information that can better facilitate managerial understanding of the subcultures at hand.

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“Culture is a blank space, a highly respected, empty pigeonhole. Economists call it ‘tastes’ and leave it strictly alone. Most philosophers ignore it—to their own loss. Marxists treat it obliquely as ideology or superstructure. Psychologists avoid it by concentrating on child subjects. Historians bend it anyway they like. Most believe it matters, especially travel agents.”

- *Mary Douglas (Trice, 1993, 20)*



“Culture, with us, ends in headache.”

-*Ralph Waldo Emerson, Experience, 1841*

AN INVESTIGATION TO DISCERN ORGANIZATIONAL SUBCULTURES:  
THE CASE OF A HOSPITAL SETTING.

**PROJECT DESCRIPTION**

A review of extant literature found a lack of scholarly research relating to how multiple cultures coexist in the workplace. In the past, only the effects of national culture identity (i.e. “ethnic” identity) have been investigated. This thesis seeks to explore general differences among cultures, be they professional cultures, regional distinctions, functional differences, or other social groupings that might give rise to differential subcultures in the workplace.

The basis for the quantitative instrument used herein was based on a value set developed by O’Reilly et al. (1991) for testing the fit of persons to organizational cultures. The Organizational Culture Profile (OCP) contained 54 “value statements” assessing attitudes toward, for instance, quality, respect for individuals, flexibility, and risk taking. These value statements emerged from a review of academic and practitioner-oriented writings on organizational values and culture.

Our research made use of the OCP value set to identify and describe distinct subcultures within the workplace. It has often been assumed that subcultures distinct from an overall ‘corporate culture’ do exist within a single organization, but it appears this assumption has rarely been corroborated empirically in any methodical way.

In order to detect the presence of differentiated cultures (subcultures) within an organization, a total sample of staff was attempted within a hospital setting. Questionnaires were made available to every staff member and all had the option of participating in the study. The questionnaire provided data that allowed quantitative comparisons of “value profiles” between subgroups defined by their roles within the organization.

Our hypotheses, that employees will report different levels of importance for work-related values depending on their functional specialization within the organization, and that these cultural differences will follow predictable patterns, appears to be borne out. It can be shown that Nurses in the organization report importance on various work-related values differently than do other employees. However, a small sample size hampered statistical analysis. Anecdotal evidence from personnel interviews did reinforce quantitative conclusions. Based on the work of O’Reilly et al. (1991), we expected to see patterned differences in eight dimensions of culture; attention to detail, outcome orientation, aggressiveness, supportiveness, emphasis on rewards, team orientation, decisiveness, and time horizon. These results were not replicated, but insufficient sample size precludes their dismissal. Furthermore, the unique nature of the organization studied in this investigation may be responsible in part or in whole for the character of the picture we derived from the data.

# 1 INTRODUCTION

Beginning with C.P. Snow's writing in the 1950's about the gap between "the two cultures" (the humanities and science), the idea that culture can conceptually represent smaller groups in a greater society has been tacitly understood. The word culture came to be applied to the collective attitudes and behaviour of business organizations in the 1980s and early 1990s. Its usage in the jargon of business was probably also advanced by a growing awareness of the importance of genuine cultural differences in a global economy, as between Americans and the Japanese, that have a broad effect on business practices. Yet the exploration we have undertaken here is concerned with groups even smaller than entire corporations: We are speaking of the cultural groups that people might recognize intuitively as being important *within* a corporation; groups that import or develop their own subculture, which operates more or less independently of the typically-conceived-of "monolithic" corporate culture.

There is a clear lack of scholarly research and writing that might illuminate our understanding of how multiple cultures coexist in the workplace. The small amount of literature that exists is concerned almost exclusively with national-culture identity. What is required is an understanding of general differences among cultures, whether they are professional cultures, regional distinctions, functional differences, or other social groupings that might occur in the workplace. In order to begin to understand these differences, the present study at-

tempts to demonstrate scientifically that different cultures do exist within the workplace, and that these different cultures can be identified and characterized relative to one another. By doing so, this current work can serve as a foundation for more exploratory and explanatory work in the future.

The phrase “organizational culture” is common in business literature, and in its common usage it connotes an overarching, unified culture within an organization. There is no dispute that an organization can foster a single set of procedures, values, and ethics among its members, but it seems that this is an incomplete conception of organizational culture, which fails to capture fully the rich tapestry of social interaction within the organization. In order truly to understand the socio-cultural environment, and if a researcher desires to link ‘organizational culture’ to other variables in the study of organizations, it will be necessary to account for other forms of culture that operate within the organization. Even while a monolithic corporate culture operates almost transparently in the background, it is likely an organization’s employees go about their daily tasks amidst a much richer, more localized foreground tapestry of subcultures. In fact, the organization’s cultural landscape is best envisioned as a field of multi-layered and interwoven subcultures.

This idea that more than one culture can operate simultaneously within an organization is not new *per se*. However, few authors have made scholarly studies of organizations as multicultural environments. The notable exception to this statement would be studies of professional cultures such as those offered by

Patchen (1974), Barley (1983), Van Maanen & Barley (1984), and Trice (1993). Professional cultures are one form of culture that enter into the workplace, but it must be recognized that there exists a wide range of kernels out of which cultures can grow in the workplace, and any of them will have consequences on organizational behaviours.

The assertion of this thesis is this: To view organizational culture as a uniform and monolithic entity does not do justice to the rich spectrum of forces that shape cultures, and the corresponding variety of subcultures that are present in any organization. Other authors agree: “More researchers have emphasized the homogeneity of culture and its cohesive function rather than its divisive potential” (Gregory, 1983). Gregory says it is more appropriate to view organizations as multicultural. Subgroups within the organization can be defined along occupational, hierarchic, divisional, or other lines. Each subgroup “approaches organizational interactions with their own meanings and senses of priorities” (Gregory, 1983: 359).

## **1.1 Definition of Culture**

Before we can proceed any further, we must develop an understanding of what the term “culture” means in the context of the present work, given our focus on organizational cultures. In order to do this, we will limit our scope to previous research that is commonly reviewed in management literature. Disciplines such as anthropology or psychology develop overlapping but fundamentally different definitions of what is culture. This is not to say that other disciplines’ under-

standings of culture are not of interest to students of management, but often times these other definitions of culture are too broad, too narrow, or technically limiting for someone trying to understand what is culture in the context of organizations.

For the purpose at hand, we can take culture to be something that a group of people *has*, as opposed to something the group *is* (Smircich, 1983). While this has been the most common conception of organizational cultures (that is, that culture is an attribute of organizations), there have been theorists who take the view that groups or organizations *are* cultures (Van Maanen & Barley, 1984; Meyerson & Martin, 1987). If organizations have culture, then it is intuitive to think that different organizations might have different cultures. Indeed, culture has been described as,

“the collective programming of the mind which distinguishes the members of one human group from another... Culture determines the identity of a human group in the same way as personality determines the identity of an individual.” (Hofstede, 1980).

Thus, we can understand culture to be a differentiating characteristic of a group, much like the “personality” of the group. But where does a group hold its culture? Many theorists make oblique reference to intangible elements of culture that reside at the population level of analysis (for example, Holden & Wilhelmij, 1995). This is difficult to conceptualize, and is probably most discussed in studies of knowledge management, where the sum total of organization knowledge is often larger than the sum of individuals’ knowledge. We should not neglect the

possibility that culture is, in part, a group phenomenon, but it is clear that culture is intertwined with the cognitive processes of individuals. It has been common for researchers to agree that culture resides in *cognitions held in common* by members of a social group (e.g. Geertz, 1973; Smircich, 1983). Rousseau (1990) suggests a framework for these cognitions; it includes “fundamental assumptions, values, behavioural norms and expectations, and larger patterns of behaviour.” Indeed, values held in common become a central element of most working definitions of culture in business literature.

Therefore, the definition of culture used in this project will be this: *Culture is a socially created set of beliefs formed around values that are shared in common.* Of course, we cannot directly see the values that people hold; we only see visible indicators that hint at underlying values. One of the most important products of a group’s values will be the emergence of a set of accepted norms. When norms emerge out of a group’s common values, they serve to guide what is acceptable behaviour for group members. Therefore many practitioners try to observe behaviour as one way of uncovering the group’s core values (for example Tylor, 1871; Deal & Kennedy, 1982; McDaniels & Gregory, 1991; Martin, 1992 ; Trice & Beyer, 1993). Studying the tangible objects produced by a group is another. The term “artefacts” is often used to indicate the tangible products (both objects and actions) created by a cultural group (Hofstede, 1980; Schein, 1992; Miraglia et al.).

More than just being a means of identifying a group's underlying values; the artefacts that a group produces have an important role for the group. Cultural artefacts embody special significance to members of the group. The presence of cultural artefacts serves to reinforce the veracity of the very culture that spawned them; and a strong culture will produce more artefacts in turn (Schein, 1992). This circular nature of culture is important to understand. A group's culture is reinforced by the presence of artefacts that affirm its worldview; yet these very artefacts are produced in accordance with the underlying values of that culture.

The aforementioned cycle might lead us to expect culture to become stagnant or static. This is not the case. While culture tends to be stable, it is not static. Culture changes with time and circumstance. Culture is a realization of collective values, but those values are held in the minds of individuals. The creation of culture is an iterative process; it requires affirming, testing, adjusting and reaffirming values. In this way, culture can slowly evolve as a group's values shift. Too many attempts at forcing organizational culture change have failed, perhaps because this gradual, iterative process has been ignored. It would likely be wiser to talk about "corporate values" than "corporate culture."

It is not necessary that every member of a cultural group hold an identical understanding of their culture. Indeed, in most organizations, this is nearly impossible since individuals usually belong to multiple subcultures. By belonging to more than one cultural (or subcultural) group, an individual's values and attitudes are subtly altered. The membership patterns of different individuals will

probably not be the same—two people will generally differ in the set of cultures to which each is a member. The resulting intertwining or blending of cultural identities within an individual gives that person their own particular ‘flavour’. In other words, different individuals within a cultural group each have exposure to several alternate cultural patterns. With these varying cultural exposure patterns, different individuals will differ somewhat in their values, thoughts, and actions. Of course, such variations can be a good thing. It is these inconsistencies that are the source of new norms being injected into the circular pattern described above. Without a doubt,

“culture is not a ‘closed circle...’ there is room in it for the individual and his inventions. Indeed, the growth of culture is, as we have said, a process of learning, and its modifications are modifications made in the minds of learning individuals” (Ellwood, 1918, 796).

This understanding of culture essentially takes an open-systems perspective, which is to say that a group’s culture is continually influenced by that group’s environment and by the changing pressures that constantly challenge commonly held values (Scott, 1998). As individuals learn new ways of dealing with external pressures, and accepted norms gradually become taken for granted by the group, then values held in common will change as a result. This is essentially the argument put forth by Edgar Schein, which is discussed below.

## 1.2 Definition of Subculture

The understanding of the culture concept developed above allows us to better comprehend the related concepts of subculture, and organizational culture. From the earliest studies of culture, it has been recognized that the cultural colour palate contains a wide variety of shades. “Culture, we see, rather consists of a number of growing traditions, each concerning a different phase of a very complex life-process” (Ellwood, 1918, 797). Subcultures are cultural subgroups that, while sharing some common elements of a larger culture, are distinguished by their distinctive patterns of ideologies, and cultural forms including values and practices. These sometimes-subtle distinctions make subcultures different from the primary culture and from each other (Lok & Crawford, 2001). Subcultures develop in response to unique and pressing circumstances (Clarke, 1974). Therefore, wherever a subset of a culture’s members shares a situation that is not shared by other members of that culture, there is opportunity for a subculture to develop. Individuals may be members of multiple subcultures. For example, the author considers himself to be a Canadian, but is also a student at Carleton University, a father, an Anglophone, and a member of a local Linux Users’ Group, among other things. Subcultures can easily be seen as overlapping, and an individual’s “cultural identity” can change depending on the situation in which the individual finds himself. Certainly a person’s role as father is primary when playing with his own kids, but that role becomes secondary when discussing com-

puters with other Linux users. In this regard, subcultures are linked to the concept of role set as developed by psychologists.

### 1.3 Subcultures in the Context of Organizations

“Culture is not particular to the whole organization, except maybe for small, simple organizations. Instead, there might be as many cultures as subunits within the group. There is no basis to assume these subunits are linked by culture to each other or the parent organization” (Vaughn, 1996).

Slowly, authors in the field are beginning to recognize the gap in existing literature on the subject of organizational subcultures. That subcultures exist within organizations but heretofore have been largely unstudied requires,

“...a shift in emphasis in study of organizational culture; it is not necessarily correct to assume a single, overall culture within the organization, but instead a complex web of interrelating, interacting, and adaptive subcultures...” (Trice, 1993).

It is conceivable for subcultures to arise in an organization wherever a set of people together face unique challenges which differentiate their needs or experiences from the rest of the organization’s (Vaughn, 1996; Lok & Crawford, 2001). Schein (1992) provides a list of the most common bases for cultural differentiation (subcultures) within organizations, which are:

- Function/occupation
- Geography
- Product, market, or technology
- “Divisionalization”
- Hierarchy
- Mergers and acquisitions
- Joint ventures, strategic alliances, multi-organizational units
- Structural opposition groups

This list, while touching on the prevalent foci of subcultures and those that are the most visible, is not a complete list. Subcultures of varying strength could develop due to physical proximity, temporary grouping (such as a task group), or around just about any other social group within the organization.

Some of the strongest subcultures develop around occupations (Trice, 1993). For professionals, this is probably related to the specialized and often intense training that is required prior to certification in their discipline. Doctors, lawyers, accountants, teachers and other professionals must receive several years of specialized instruction before attempting to enter the workforce. Many professions require certification based on examination and testing. Some require periodic recertification. The net effect of these processes is to indoctrinate members with a common set of practices and often with a common set of values. Members of these occupations and professions are frequently members of professional organizations in addition to holding a required certificate. By joining unions and other social organizations based on their occupation, members further reinforce their cultural identity as belonging to an occupational group. All of this occurs prior to entry into the work organization. This means that occupational cultures are strongly developed even before they are introduced to an organization. We can therefore expect occupational cultures to be amongst the strongest cultures found in the workplace.

## **1.4 A Basic Conceptual Framework**

Although there are many ways in which we could conceptualize the phenomena that are at play in a culturally oriented view of organizations, we will try to outline a simplified framework that will give some structure and relevance to the work that is proposed in this project. To that end, we must bring together three types of concepts to form a basic framework. Such a framework will allow us to put concepts into the proper context for later analysis. We will examine the theoretical foundations for these concepts in section three of this document.

A relationship exists between a person's underlying values, and the decisions they make. Their values are, for the sake of simplicity, tightly related to their cultural identity. A person's decisions are visible in his behaviours. Values do not directly determine decisions and behaviours. Values are a primary influence on a person's perceptions of their environment; that is, values are a determining factor in the creation of a person's mental models. Mental models are a topic of considerable discussion and research in fields of social and psychological research. We do not propose to explore them here. Our research aims only to discern variance in people's value profiles. That these value profiles are linked through mental models to behavioural decisions is assumed; if true, however, it is the basis for a strong argument about the managerial implications of organizational subcultures.

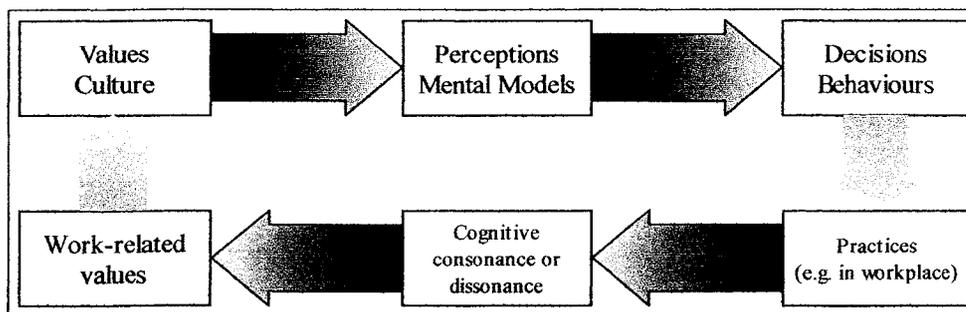


Figure 1: A simple conceptual framework for the role of cultural values in organizations.

As an interesting aside, it should be noted that the framework offered here could be bi-directional in nature. Workplace practices (i.e. behaviours) feed into work-culture values. Consider a new hire entering an organization. This person might face a situation where their pre-existing behaviours (as defined by ethics and behavioural norms) are either concordant or discordant with the behaviours preferred by the rest of his or her coworkers. If our hypothetical employee has preferred behaviours that are similar to those practiced in the office, then they should experience cognitive consonance with respect to those behaviours. On the other hand, if his accustomed behaviours are different from those of his coworkers, then theory dictates that he will experience cognitive dissonance. This cognitive state of consonance or dissonance will drive an adaptation—presumably the adoption of new behaviours that are more like those of his coworkers. Over time, these normative behaviours become routinized and can cause a shift in the underlying values our employee holds. Thus our framework can be thought of as being bi-directional in parallel, or perhaps representing a completely circular model as depicted in Figure 1.

## 1.5 Need For More Research

Plenty of management literature promises to unlock the secrets of creating, shaping, changing, or simply trying to understand an organization's culture. Only a minority of this literature is based on empirical evidence. We agree with Hofstede and Neuijen when they comment that,

“The literature on organizational cultures consists of a remarkable collection of pep talks, war stories, and some insightful in-depth case studies. There is, we believe, a dearth of ordinary research as taught by standard behavioural research methodology textbooks” (Hofstede & Neuijen, 1990).

Although the climate of research in this area is beginning to change, it is still true that relatively little empirical study has been conducted in the ten years or so since Hofstede and Neuijen wrote their statement, above. Even now, our understanding of organizational cultures is based upon a relatively small body of work. Further, what knowledge we have of organizational cultures comes largely from work that assumes a single, unified culture within an organization. There is a lack of scholarly investigation into the occurrence of subcultures within organizations that may operate in addition to a unified overarching organizational culture. Virtually all previous empirical investigation of organizational cultures has compared across cultures at the national level, and few of these studies make reference to any forms of culture identity other than national culture identity. Much of this research has been fundamentally flawed as well. For example, several authors have made errors as simple as taking national identity to be synonymous with culture without further explanation, investigation, or qualification.

## 1.6 Objectives of this Research

The current research was undertaken to demonstrate the existence of organizational subcultures; to show that these subcultures are not necessarily ethnic or national in nature; and to investigate a method to identify and to characterize them. Finding a suitable method of study will allow for further research to be undertaken for the purpose of improving our knowledge of the effects of culture and subcultures on organizational processes and planning. By showing that organizational subcultures do indeed exist and can be measured and characterized, we hope to lend support to the small volume of writing that has begun to reject the notion of an exclusive, monolithic corporate culture. Qualitative works have suggested this direction (for example Sackmann, 1992), now we aim to supplement that work with quantitative methods.

In order to perform research on the ramifications of multiple subcultures within organizations, it is necessary to establish that distinct subcultures do, in fact, exist within an organization. Furthermore, a method for identifying distinct subcultures and describing them needs to be developed. With these objectives in mind, the current research set out to lay a foundation for future research into organizational subcultures, and to develop an instrument that will detect and describe subcultures within an organization based on how important certain values are perceived to be in people's primary work units.

The instrument used here was based on a value set developed by O'Reilly et al. (1991). O'Reilly et al. originally delivered the set in a different instrument

from that which is proposed here. In the 1991 study, an Organizational Culture Profile (OCP) was developed, which allowed the authors to compare cultures across whole organizations. By using the value set created for the OCP, we capitalize on refinements and testing performed by O'Reilly et al. Unfortunately, the methodology originally used with the OCP was prohibitively demanding in terms of resources (time, 'manpower', and funding) for a project such as that undertaken here. Therefore, in order to profile subcultures for comparison within organizations, we chose to rely on a new instrument and method to deliver the same value set. The suitability of the proposed instrument is subject to review. To develop an instrument that can be delivered to subjects with greater speed, ease, and at a lower cost, is of potential benefit not only to future researchers, but also to practitioners who desire to capitalize on present and future theory of organizational subcultures and behaviour.

## 2 LITERATURE REVIEW

In this section we set out to explore current literature as it pertains to the study of organizational subcultures. Much of the existing body of work does not deal directly with the concept of subculture *per se*, but deals more generally with issues of culture. Fortunately, the concept of a subculture is identical to that of a culture except that subculture implies some relationship to a greater superculture. We will use the terms *culture* and *subculture* interchangeably in this chapter. The reader might question why the literature review presented here focuses on *culture* and makes hardly any mention of *subculture*. In part this is because so little of the existing literature concerns itself with this distinction. It is also because we must understand the fundamentals of *culture* before we can appreciate the nuance of *subculture*.

Looking at the extensive body of work that is culturally oriented can teach us a lot. However an exhaustive exploration of culture literature is beyond the scope of this document. Instead, we will focus here on issues of culture and subculture that should be of interest to those researchers and managers who deal with subcultures in organizations. We aim to give a general picture of the state of knowledge about various managerial and research concerns, and we urge the reader to explore particular subtopics of interest more fully than can be done justice here.

## 2.1 Definitions of Culture

“The concept of culture I espouse is essentially a semiotic one. Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning” (Geertz, 1973:5 in Sperber & Hirschfeld, 1999).

Indeed, Geertz captures an important idea in the preceding paragraph. A great deal of difficulty arises whenever research is conducted that tries to capture a social process and strip it of all subjective meaning. The fact that culture is a social creation and also is a subjective reality has led to a great diversity of definitions for this concept. Interestingly, even though there is a lot of diversity in defining culture, there is not much dispute among academics as to what culture is. We will show, below, that many definitions of culture are fairly complimentary.

### 2.1.1 *Diverse Definitions*

The concept of culture has been a focus of anthropologists and sociologists for more than a century. British anthropologist Sir Edward Tylor (1832-1917) is generally credited as being the first scientist to define culture in terms of socially patterned thought and behaviour. Following his work, the concept of culture has been defined in a large variety of ways. The specific culture concept that is identified in any given definition typically varies according to the theoretical outlook of the researcher. For example, the following table from Miraglia et al. gives a sample of eight common definitions of culture from different points of view. This set is in no way exhaustive; there are dozens of alternatives:

Topical	Culture consists of everything on a list of topics, or categories, such as social organization, religion, or economy
Historical	Culture is social heritage, or tradition, that is passed on to future generations
Behavioural	Culture is shared, learned human behaviour, a way of life
Normative	Culture is ideals, values, or rules for living
Functional	Culture is the way humans solve problems of adapting to the environment or living together
Mental	Culture is a complex of ideas, or learned habits, that inhibit impulses and distinguish people from animals
Structural	Culture consists of patterned and interrelated ideas, symbols, or behaviours
Symbolic	Culture is based on arbitrarily assigned meanings that are shared by a society

Table 1: Diverse definitions of culture (taken from Bodley as cited in Miraglia et al.)

Such a broad variety of viewpoints have created a wide array of definitions for the culture concept across several fields of study. Even restricted to the field of management literature, definitions of culture vary.

### **2.1.2 Similarity of Concepts**

Given the bewildering array of definitions of culture, a reader might despair. However, making sense of these concepts is not as difficult as it first appears. On closer inspection it becomes clear that most definitions of the culture concept deal with either or both of two primary aspects of culture. One aspect is the visible and tangible elements of culture—the behaviours and artefacts produced by members of a culture; the other aspect deals with communal values, attitudes, and assumptions. Furthermore, it has been shown that regardless of the background of the researcher, or his or her field of study,

“almost all studies of culture have used roughly equivalent terms and constructs. The differences lie in how objective or subjective, conscious or unconscious these terms and constructs are, and which key elements are chosen as the focus for study” (Barley, cited in O’Reilly et al., 1991).

Even though there exists debate about how exactly to define “culture,” this should not prevent us from attempting to learn more about the concept.

### **2.1.3 Culture as Norms, Values, Actions and Objects**

Culture involves three parts: What people think, what they do, and the material products they create (Hofstede, 1980; Schein, 1992; Miraglia et al.). When defining and examining culture, some researchers prefer a sociological focus, and concentrate study on people’s actions; these actions are often described by norms (Tse et al., 1988; Lytle et al., 1995). Others take an approach that focuses study on the tangible products (including behaviours) that are created by, and therefore represent a culture (Deal & Kennedy, 1982; Trice and Beyer, 1984; McDaniels & Gregory, 1991; Martin, 1992). Somewhat less common is an ethnographic approach where the focus is placed on shared social structural elements (economic, social, political, religious, etc.) and the institutions that provide context in our lives. (Lytle et al., 1995). Of the three parts of culture (“think”; “do”; and “create”), the most adhered to understanding of organizational cultures deals with what people “think.” A preponderance of researchers and practitioners follow the belief that shared values best represent a group’s culture (Hofstede, 1980; Smircich, 1983; Gowler & Legge, 1986; Schneider, 1990; De Long & Fahey, 2000; Lenartowicz et al., 2003). It is worthwhile to note an important variant of this be-

lief: The core of culture lies in a group's shared basic assumptions (Schein, 1996a). We will examine this idea in more detail later in this document.

Culture has been shown to be a public property (Sperber & Hirschfeld, 1999). It is frequently described as a set of routinized solutions to problems faced by a group (Vaughn, 1996). Although culture is a group phenomenon, it is wrapped up in the thought processes of individuals. Thus there are those who give a great deal of attention to the interaction between culture, and individuals' behaviour (Clarke, 1974; McDaniels & Gregory, 1991). Once in a while, it is possible to find a theorist who attempts to create and/or operationalize an all-inclusive definition of culture, for example Porter (1972), who defines culture as consisting of beliefs, values, attitudes, concepts of self, hierarchies of status, role expectations, spatial relations, and time concepts. Usually these kinds of definitions are avoided since they become unwieldy and complex to utilize in any empirical study.

#### **2.1.4 Culture as Metaphors**

Quinn (1987) performed a study of Americans' understandings of marriage and showed that a web of interconnected metaphors that acts to define people's understanding of social institutions. For example, Quinn was able to describe marriage with the following metaphoric statements: Marriage is enduring; marriage is mutually beneficial; marriage is unknown at the outset; marriage is difficult; marriage is effortful; marriage is joint; marriage may succeed or fail; marriage is risky. Together such metaphors make a cultural model. These metaphors

are built, in turn, on other cultural assumptions that come out of models of other everyday domains: Quinn refers to domains including the folk physics of difficult activities, the folk social psychology of voluntary relationships, the folk theory of probability, and the folk psychology of human needs. Cultural models of behaviour that are built on recursive foundations of other models “provide a continuity and coherency in a given culture’s systems of belief” (Sperber & Hirschfeld, 1999).

### **2.1.5 Culture as Schemata**

Not unrelated to the metaphoric model of culture is the idea that culture is a set of schemata. Schemata have been described as “cognitive constructs, which allow for the organization of information in long-term memory” (Widdowson, 1983). There are cognitive characteristics of schemata that allow individuals to relate incoming information to already known information. Cognitive anthropology has begun to deal with larger knowledge structures that resemble the ideas we are pursuing in our discussion of culture here. In that field, such structures are referred to as cultural schemata or cultural models (Widdowson, 1983; Cook, 1989; Singhal, 1998). Clearly we see that culture is not a simple concept. Neither is it easy to separate from situations or the people within them.

## **2.2 Determinants of Culture**

Culture springs up in response to a variety of conditions. Here we explore some of the factors that can impact on and shape the growth of multiple cultures

or subcultures in an organization. The determinants explored here may be present to greater or lesser degrees or may not even be a factor in any given situation. We present these simply as a set of conditions that should be borne in mind when investigating cultures and subcultures in organizations.

### ***2.2.1 Interaction Between Dominant and Sub-Cultures***

A subculture may or may not reflect the “parent” culture of the organization within which it is found. The subculture of the group or unit can include the core values of the dominant organizational culture (if it exists) plus additional values unique to members of the group/department (Martin & Siehl, 1983; Lok & Crawford, 2001; Palthe & Kossek, 2003). A dominant culture might act as an intervening variable in the moulding of organizational subcultures; that is, it can play an important role in contributing to the value set of each employee, though it is not an exclusive source of influence in this regard. Although it is likely that a subculture operating within an organization will be affected by the dominant culture of that organization (due to constant contact with other parts of that organization), it cannot be assumed that this is always the case. Therefore, profiling organizational subcultures in the way that is proposed by the current project is a necessary endeavour.

Martin & Siehl (1983) explored three possible conditions where a dominant culture and a subculture coexist. They assigned names to each of the three conditions, calling them Enhancing, Orthogonal, and Countercultural. In the Enhancing scenario, the dominant culture’s core values are held even more strongly

by the subgroup than in general population. An Orthogonal subculture is simultaneously accepting of the dominant culture's core values, and also holds a separate, non-conflicting set of values of its own. For example, this is the case for departments wherein company culture is largely accepted, but members still adhere to their own professional cultural values, as in accounting or engineering disciplines. The Countercultural subculture has some values that exist in direct conflict with those of the dominant culture. Thus there exists an "uneasy symbiosis" with two value systems taking opposing positions on matters of importance to both.

## **2.2.2 Demographic Groups and Culture**

### **2.2.2.1 Ethnicity and culture**

The terms "ethnic" and "ethnicity" are very much intertwined with the concept of culture. In fact, many definitions of ethnicity include culture as a defining characteristic. For example, Webster's Dictionary defines ethnicity as, "of or relating to large groups of people classed according to common racial, national, tribal, religious, linguistic, or cultural origin or background." The etymology derives from the Greek adjective *ethnikos*, meaning "national, foreign, gentile." That adjective is derived from the noun *ethnos*, "people, nation, or foreign people." Not surprisingly, researchers often treat "ethnicity" as being synonymous with national identity. Unfortunately, researchers usually treat national identity as being synonymous with cultural identity. The result is that these three terms, while similar, are used often interchangeably, and to the detriment of good

science in our opinion. It should be recognized that the definition of ethnicity given above, which we believe to be an accurate representation of how this term is generally understood, does *not* limit its sense to distinctions of nationality. Rather, ethnicity generally refers to classifications that span across geo-political boundaries, following instead the boundaries outlined by race, tribe, religion, and language in addition to political national boundaries.

The concept of ethnicity has been related to varying customs, structures, languages, attitudes, histories, and ideologies. More recently, ethnic identification has been studied as it sets boundaries between diverse subcultures (Johnson & Johnson, 1975). It is fairly evident that an increasing number of studies in the United States have been concerned with the managerial implications of ethnicity, and especially that ethnic group labelled as Hispanic. It has been recognized recently (though surely it is intuitive) that such a broad label as “Hispanic,” which incorporates a variety of Latin American cultures, may not always be helpful since “the diversity in cultural values and collective national experience [among Hispanics] is too great to generalize” (Romero, 2004). However Romero also stresses, “the existence of micro-level cultures in Latin America does not remove the value of a macro perspective of Hispanic culture.”

The real lesson here is that the student of culture should try to remain aware of basic similarities that are the likely bases for clustering peoples into ethnic categories. In the example of Hispanic ethnicity, these mutual links are 1) a shared language and major religion (Catholicism) which is common to Latin

American cultures due to 2) their common link to Spain (Zea, 1963, in Romero, 2004) which contributed to 3) similar economic and colonial histories (Cardoso & Faletto, 1979, in Romero, 2004). At some times it may be appropriate to deal with the culture of Hispanics, at other times it may be more appropriate to isolate national-level cultures for study.

#### **2.2.2.2 Geography and culture**

Geography plays a vital role in the formation and continuation of many forms of culture. The physical characteristics of landscape and environment will impose certain problems or unique challenges on a group of people who live and work in that environment. By necessity, a group must develop a set of responses to those challenges; a routinized set of responses and behaviours is a key ingredient for the creation of a culture or subculture. Geographic features can also serve interfere with cultural sharing and assimilation or acculturation (Parisi et al., 2003). The field of “place studies” is the domain of research that focuses on place, which is generally understood as space made meaningful. Meaning is created and held collectively, and studies of the “culture of place” are spawned to investigate the same.

“Sociologists and anthropologists have found that the culture of place, the influence of local social patterns and interpretations, is more robust than earlier theories had imagined. Even the most standardized products of global capitalism get localized in practice, as when elderly Chinese women transform fast food into slow food as they pass the day in the safety of McDonald’s while waiting to pick up their grandchildren from school” (Watson, 1997, in Griswold & Wright, 2004).

Despite the worldwide trend globalization and in the face of an explosive growth of communication technologies, regional cultures are being found to be both enduring and reproducing themselves. In the United States, this phenomenon was found by Griswold & Wright (2004) to be due not only to locals holding fast to their traditions but also to the eager desire of new arrivals to become knowledgeable about the culture of place as part of their ongoing identity construction (particularly that of “cosmopolitan” city dwellers transplanted to country settings). The expression of social, economic, and political differences along geographic lines is considered to be “part and parcel of American political life” (Elazar, 1998). That these differences grow out of geographic variations is explained this way:

“Geographic diversity ... helped to anchor the moralistic, individualistic, and traditionalistic political cultures in particular areas because each regional environment presented sets of common problems and opportunities around which diverse settlers had to organize their social, economic, and political systems. The sharing of long-term common interests and political cultural orientations has continued to invest these regions with political reality” (Kincaid, 1982).

Lieske (1993) explains a model for the growth of American subcultures that links patterns of immigration and expansion to cultural dispersion. He cites a process of cultural blending combined with adaptive processes that respond to unique challenges of different regions as giving rise to regional subcultures (as opposed to cultures), which is contrasted with the existence of territorially based cultures such as those in India or Yugoslavia.

Such studies are not limited to the United States; many studies focused on regionalism have been conducted in Europe. There has been renewed interest in the topic due to the genesis of the European Union. For example, Giordano (1999) investigated a resurgence of political regionalism in Italy and found that geographical contexts are a crucial determinant of support for regionalist parties.

### **2.2.2.3 Language and culture**

Language is one of the key products (i.e. artefacts) of any culture. While some forms of culture might create entire languages, others develop sets of vocabulary—specialized words with meaning or relevance only to the members of that group—also called lingo or jargon. Language is not only a means of communication, but is also an identity marker or even a barrier that sharply separates in-groups from out-groups (Laitin, 2000). Schein (1992) states that language and a common system of communication are so ingrained that they become inherent parts of the “shared basic assumptions” that are the core of culture. These elements are what permit functioning at a conceptual level. Indeed, “thought is affected by the categories and words available in our language,” (Hofstede, 1980: 34) which can be taken to mean observers will hold differing pictures of the universe unless their linguistic backgrounds are similar. This is one interpretation of the well-known Sapir-Whorf hypothesis (Sapir, 1921; Whorf, 1956). Communication is so intertwined with culture that it could be possible to describe organizational cultures based only on a composite of their communication rules (Schall, 1983). At the very least, it is abundantly clear that culture affects communication

preferences (Gudykunst & Ting-Toomey, 1988; Sanchez-Burks et al., 2003; Sarquisse et al., 2003). Therefore language must be considered as an important operant in organizational environments—one that must be considered when attempting to study culture (Li-Jun Ji et al., 1987) or affect change on it (Theibert, 1995).

#### **2.2.2.4 Religion and culture**

The Oxford Dictionary provides a non-theistic definition of religion that states “religion is a system of beliefs and practices by means of which a group of people struggles with the ultimate problems of human life.” To “beliefs and practices” we might also add attitudes. Like language, religion is a major discriminator between cultural groups. It can and does provide sharp delineation between in-group and out-group identities. It is often taken as a proxy for culture in research, and in certain circumstances this is a relatively safe assumption to make (Shechtman et al., 2003).

Some scholars subscribe to an economic theory of religion that takes a free-market view of the availability of religion in a society. This view builds on the work of Adam Smith’s *The Wealth Of Nations*. Smith believed well-established churches would lose their appeal over time since their clergymen, having no real incentive to make their message compelling to the population, would grow complacent. Religions facing competitive pressure, however, would work harder and thrive. A theory like this can explain why European society, with its tradition of established state or cultural churches has had a decrease in religiosity, while

America has become more religiously energetic in the midst of a diversity of religious options. It is implicit in a theory like this that cultures affect religions.

Should religion be the concern of managers? This is truly an unfashionable topic (Mentzer, 2002). Weaver and Agle (2002) are among the small but growing number of scholars that have tackled the subject, albeit with somewhat controversial conclusions, as Mentzer points out. Sanders et al. (2004) found causal links between spirituality and leadership, and also spirituality and organizational commitment. This is concordant with the findings of Neck & Milliman (1994) who saw spirituality to have positive effects on organizational performance. Konz & Ryan (1999) argue that organizations can be fashioned according to a particular model of spirituality through conscientious hiring of individuals who have particular spiritual values, and through the reinforcing guidance of a spiritually aware organizational leader. This outlook follows the theory of Schein (1992), Trice & Beyer (1993) and others. They do admit, however, that visualizing such an organization is far easier than creating or maintaining one. Since religions are so tightly tied with culture outside the workplace, and religion is being recognized as important more and more inside the workplace, it stands to reason that religio-cultural processes may hold influence inside organizations and religion is a topic of potentially great importance for organizational researchers.

### **2.2.3 Occupation and Culture**

The study of occupational cultures is generally the only field that systematically has been concerned with the presence of organizational subcultures. Or-

ganizations are potent forces in work life, but occupations remain a primary method of organizing work (Trice, 1993). Studying occupational “communities” is a profoundly different point of view from “traditional” studies of organizations. Van Maanen & Barley (1984) offer a simple hypothetical situation: Consider the auto repairman down at “Joe’s Garage.” In the ethnographic view he is a “mechanic,” whereas a more traditional organizational view would label him as an “employee.” The repairman would likely consider himself to be the former. This work-oriented classification also is imbued with considerably more meaning, and might be of more value to a researcher in many situations.

Occupations can often be the product of formalized training regimes (such as classroom training, apprenticeships, or the like) and in these cases are often subject to quality control methods, such as standardized testing, that ensure practitioners of an occupation are operating at or above a minimum standard level. A by-product of this training and testing is to indoctrinate the trainee with common values and attitudes, as well as knowledge, skills, and methods. However, these conditions do not have to be the case and strong occupational cultures can still exist with socialization of members occurring through other mechanisms. Occupations can form strong cultures of solidarity, such as those found by Barton (2003). In his investigation of attempts to reform police services in the United Kingdom, Barton was critical of the lack of understanding of police cultures. He clearly states that these cultures need to be borne in mind before making any attempts at implementing reforms. Also of note, Barton mentions,

“unless efforts are made to engage individual officers, particularly the lower ranks, in the process of police reform, it is unlikely that any meaningful and long lasting change will occur” (Barton, 2003). This emphasis on the lower echelons of the cultural group in question implies (correctly, we think) a longitudinal process of socialization or institutionalization in which members of the group acquire values and normalized behaviours gradually.

Occupational subcultures are important to study since “parts within an organization often grow more to resemble members’ affiliations and experiences rather than parent organization’s background or influence” (Schein, 1996b). When managers fail to link issues of occupational culture to organisational climate, backlash can occur. Too frequently, managers tend to ignore distinct subculture identities and instead treat the organization as if it has but a single culture (Cameron, 2001). There can be a variety of problems associated with having a mix of occupational groups with an organization. Their different values, priorities and decision-making strategies frequently produce cultural barriers to overall progress toward goals like decision-making and learning. These cultural barriers can be thought of as occupational frames, which can be both limiting and self-protective (Hansen, 1995). Occupational communities’ power within organizations generally stems from their possession of unique and/or specialized knowledge (Van Maanen & Barley, 1984). Occupations form dynamic, not static, collectives; control over their unique body of task knowledge will vary over time (Trice, 1993).

#### **2.2.4 Hierarchy and Culture**

There are two key ways of thinking about hierarchy and culture as it relates to organizations. The first is to observe the differences between cultures that form along hierarchical lines. The second is to investigate a “culture of advancement,” if it exists, and look at the ways that promotions and “climbing the ladder” are (or aren’t) important to the members of a particular organization. Of the former, the most basic observation that can be made is the distinction in status between supervisors and those they supervise. A formal authority given to the supervisors tends to create social distance between them and their subordinates. Although they might be friendly, the two will never be equals, and as a result, supervisors are seldom part of the informal friendship groups that form among the subordinates (Trice & Beyer, 1993). Mid-level supervisors and managers may not interact with each other very much; often this is due to physical separation. However, members of the top management stratum are usually in a position to interact with one another on a regular basis and are therefore likely to develop a cohesive subculture of their own (Mintzberg, 1975). Another possible factor leading to hierarchical stratification of subcultures is the potential for social homogeneity within a stratum. For instance, Ouchi and Johnson (1978, in Trice & Beyer, 1993) found top managers in some corporations to come from the same ethnic groups, have similar religious backgrounds, and education.

### **2.2.5 Other Subcultures Within Organizations**

The discussion presented here has touched on some of the principal factors that affect the development of cultures and subcultures. There is, however, any number of sources of influence that can have such effects. Trice & Beyer (1993) present an excellent discussion of subcultures as manifested in organizations. Additional subcultures that they explore are presented here in brief:

#### **2.2.5.1 Friendship groups**

These groups are often formed along lines of similarity in personal interests and social status, although within organizations the preferences for selecting friends are usually limited by formal structures. Ritualized humour, joking, and horseplay are indicators of shared understanding and the presence of social subcultures. There has been considerable research in this area.

#### **2.2.5.2 Proximity**

Being located in relatively close physical proximity is strongly related to the formation of informal friendship groups, and through them, subcultures. Various items of research have demonstrated this in different ways. Lincoln & Miller (1979) showed that high-status employees were likely to base their friendships on status characteristics and symbols while low-status employees often based friendships on proximity. Gertler (1995) demonstrated that proximity (both physical proximity, and sameness of organizational practices) affects or-

ganizational cultures and the abilities of organizations to adopt new manufacturing technologies.

#### **2.2.5.3 Product, market, work flow, or technology and culture**

When looking at an organizational structure in terms of its subcultures, it is important to consider the technologies in use in different work processes. Groupings can occur of people who share similar tasks, or have interdependent tasks. It is important not to discount the knowledge possessed by workers, since specialized knowledge is as important an element of the job as are the tools and equipment that workers use (Woodward, 1980). Often it is apparent that people who have been trained in a particular specialized knowledge field will adopt the paradigms and ideology specific to their discipline. Trice & Beyer (1993) offer a preliminary list: Scientists, accountants, economists, financiers, human resources managers, organizational behaviouralists, marketers, management information systems specialists and others are among those who are subject to such a phenomenon.

#### **2.2.5.4 Divisionalization (Departmentalization) and culture**

An organization can be structured with divisions along various lines: for example, function, geographic location, product, or service. Divisions by function might be particularly likely to create subcultures, since they are likely to contain members with similar experiences, interests, and education. "In some large organizations, members can tell which function other members belong to by the

clothes they wear” (Trice & Beyer, 1993). Geographic divisions necessarily separate members of a larger organization and preclude much interaction between divisions (though changes in communication technologies may affect this somewhat).

#### **2.2.5.5 Countercultures**

Although we address neither the specific issues that lead to creation of countercultures nor their impacts upon the organization, it is worth mentioning here that countercultures are an important and widely studied form of subculture that is equally relevant within organizations as it is in wider society. Countercultures, like any form of subculture, can have either positive or negative effects on the organization as a whole.

### **2.3 Impacts of Culture**

Culture and subcultures have important influences on the way organizations conduct themselves. In this section we look at many of the ways which existing literature shows culture to affect people and organizations.

#### **2.3.1 Culture and Perception**

Culture is a product of how and what people think. Underlying values and assumptions about the universe guide the thoughts of cultural members: “Cognitive structures ... shape evaluations, judgments, and attributions made about others; consequently, they eventually influence interactions” (Kanter & Corn, 1994).

“Human cognition takes place in a social and cultural context. It uses tools provided by culture: words, concepts, beliefs, books, microscopes and computers. Moreover, a great deal of cognition is about social and cultural phenomena” (Sperber & Hirschfeld, 1999).

This is very similar to the concept called “subjective culture” by Triandis (1972). Subjective culture is “a cultural group’s characteristic way of perceiving its social environment.” According to Triandis, differences in subjective culture lead to conflict. The actions of a culture follow logically from its values and assumptions. Misunderstanding these in a person of another culture leads to the impression that their actions are “illogical” (Champden-Turner, 1994).

Kilcourse (1995) puts forward a model of perception in which there are four bases for discrimination: physical, behavioural, role and psychological. Each basis has a different strength, and the four are arranged in a different order of priority in different individuals. Permutations of the four categories allow for differences in perception yet there exists a framework for common understanding and respect. He gives the following example:

“Whereas I may tend to base my judgements on behavioural and psychological criteria (Joe Bloggs is noisy and thick) someone else uses physical and role grounds, seeing Joe only as handsome and a top executive. We may both be right. The other person’s perceptions of Joe do not invalidate mine, and are no threat to my judgement. There is no need to become defensive, or to discount the other’s perceptions as wrong or stupid. We can discuss them, and mutually agree that [Joe] is good-looking, but a loud mouthed cretin nonetheless” (Kilcourse, 1995).

### **2.3.2 Culture and Mental Models**

“Mental models play a central and [unifying] role in representing objects, states of affairs, sequences of events, the way the world is, and the social and psychological actions of daily life. They enable individuals to make inferences and predictions, to understand phenomena, to decide what action to take and to control its execution, and above all to experience events by proxy; they allow language to be used to create representations comparable to those deriving from direct acquaintance with the world; and they relate words to the world by way of conception and perception” (Johnson-Laird, 1983).

Human beings understand the world by constructing working models of it in their minds. These models are somewhat simplified from the “real” state they represent since humans can only handle and recall a limited amount of information at one time. Therefore mental models are generally incomplete or imperfect, though they may operate very well for their purpose. Craik (1943) offers the idea of “an inner mental replica that has the same ‘relation structure’ as the phenomenon that it represents.” Mary Douglas (1986) devotes most of her volume *How Institutions Think* to building on the foundations of Emil Durkheim and Ludwig Fleck, and developing ideas about the role cognition plays in developing social bonds. Her concept of “Thought Worlds” is particularly useful to those trying to understand the interactions of subcultures inside an organization. In brief, Thought Worlds are “the idea that people may notice only certain aspects of an ambiguous situation and interpret them based on their frames of reference and/or position in the social structure” (Dougherty, 1990) which is an important understanding to have about organizational subcultures, since it has repercussions for organizational practices.

Mental models can impact on organizations in profound ways. Let us take a single example. Dougherty shows that within a firm, an understanding of 'the market' varies by department. Each "operated with a departmental "market scheme" which gave them a qualitatively different perspective on the new market" (Dougherty, 1990: 67). This study showed people's focus on the market depends on their department. The particular expertise that people hold focuses their definition and selection processes, thereby altering their understanding of the market. The result is for each department to have a slightly different view, which allows for a more comprehensive TOTAL market understanding, assuming the participation of all departments. However, expertise can separate issues into narrow, perhaps biased understandings, and dominance of a single department can lead to a limited understanding of the market. For more along these lines, it is important to consider the work of Lawrence & Lorsch (1967); Van Maanen & Barley (1984); Dunn & Ginsberg (1986) who deal with departmental cognitive orientations, occupational communities, and cognitive maps, respectively.

### **2.3.3 Culture and Risk Assessment**

Risk assessment is a heavily studied topic. It is known that cultural norms have an effect on how people perceive and evaluate risky options (Douglas & Wildavsky, 1982; Wildavsky, 1988, in McDaniels & Gregory, 1991). Just as in other fields, much of this research has been derived from cross-national studies of culture (e.g. Tse et al., 1988). There are many ways of addressing the subject, but for our purposes we present only that which sees risk analysis as a product of an in-

dividual's worldview. A simple analogy can make this point clear. A single object, for example a knife, would be seen by different individuals to present different levels of risk. A butcher may look at a knife and see a tool with which he is intimately familiar and of which he is unafraid. A toddler may look at a knife as a shiny new toy and be unaware of any inherent risk in the object. The toddler's parent would take a considerably different view of the knife, knowing the potential for injury it presents to a naïve child. An assumption like this is based on perception and is made in accordance with an individual's worldview, which is a cultural creation (Vaughn, 1996).

#### **2.3.4 Culture and Communication**

If culture determines individuals' perceptions and priorities, then intercultural communication is sure to be interesting wherever members of different cultures converge holding varying understandings of a problem. Schein extends from this idea:

“Dialogue is an important tool to help multi-cultural groups attain a shared understanding of a problem—that is, a common conception of the problem. Once this is achieved, there is at least a common basis from which to begin solving the problem. Organizational effectiveness is therefore increasingly dependent on valid communication across subculture boundaries. Integration across subcultures (the essential coordination problem) will increasingly hinge on the ability to develop an overarching common language and mental model. Any form of organizational learning, therefore, will require the evolution of shared mental models that cut across the subcultures of the organization” (Schein, 1993).

Experiments have been performed using gaming theory, which confirm the presence of cultural (national cultures) and subcultural (structural or organizational cultures) differences in the way organizations communicate and make decisions (Hesseling & Können, 1969). Interaction between cultural groups leads to “conformity” of values, increases knowledge of a greater quantity and variety of information, and causes “bonding to a choice or system as well as [leading] to a convergence of utilities” (Whyte, 1989, in Bhimani, 2003). Intercultural communication can best be understood as cultural variance in the perception of social objects and events. The best way to defeat barriers to intercultural communication is through a knowledge and understanding of those objects and events that are subject to perceptive variance (Porter, 1972). A successful learning organization is one that has also learned to manage communication (Mai, 1998).

Through all of this it should be remembered that culture is not static, and communication is one of the most potent forces that serves to change cultures. From early on it has been recognized that “intercommunication is [one of] the root processes that makes cultural evolution possible” (Ellwood, 1918).

### **2.3.5 Culture and Knowledge**

Gruber (2000) investigated cultural factors that influence sharing of knowledge, both tacit and explicit, in organizations. He found differences related to openness, trust, use of different kinds of communication channels, extent of support from top management for knowledge sharing, and the presence of a reward system linked to sharing of knowledge, all of which affect sharing of knowl-

edge. Mondak and Canache (2004) demonstrated differences across national cultures for possessing knowledge pertaining to science and the environment. Rau et al. (2004) demonstrated cross-national differences in computer performance of users with different cultural backgrounds, and attributed that difference to cognitive style (concrete versus abstract) and thinking process (thematic and functional). One of the factors that lead to a cognitive convergence of group members over time is the gradual uncovering of hidden knowledge possessed by various group members (Baba et al., 2004). As issues of organizational knowledge management become ever more important, the relationships between culture and knowledge are a “hot topic” for research in organization behaviour. We must remain aware that cultural factors can have a large effect on the knowledge that is deemed important by different individuals. De Long & Fahey broadly outline four important ways in which culture affects knowledge in organizations:

“First, culture—and particularly subcultures—shape assumptions about what knowledge is and which knowledge is worth managing. Second, culture defines the relationships between individual and organizational knowledge, determining who is expected to control specific knowledge, as well as who must share it and who can hoard it. Third, culture creates the context for social interaction that determines how knowledge will be used in particular situations. Fourth, culture shapes the processes by which new knowledge—with its accompanying uncertainties—is created, legitimated, and distributed in organizations” (De Long & Fahey, 2000).

### **2.3.6 Culture and Decision-Making**

Given that culture has such pronounced effects on perception, mental models, risk perception, knowledge and communication, it is no surprise that de-

cision-making is also heavily dependent on cultural effects. Research in negotiation shows that cultural processes have an important role to play in the perpetuation of judgment biases (Gelfand & Christakopoulou 1999). Cultural values influence what issues are important to an individual when in negotiation. Cultural norms influence what behaviours are appropriate and also direct an individual's strategies (Brett, 2001). Cross-cultural experimental research has confirmed culture affects decision-making processes and information processing strategies (Chu & Spies, 1999). Problem solving is easiest when the information that is presented to individuals is synchronous with their mental models. Problem solving is most difficult when an individual must "abandon their initial point of view in favour of a new, more appropriate one" (Pretz et al. 2003). None of this means, however, that culture will force an individual into a single mode of understanding problems; MacCrimmon and Wehrung (1986) showed that one individual can use different decision-making approaches in different contexts. Also, having different cultures represented in a decision-making process is not necessarily problematic. A cooperative group can engage in constructive controversy that airs alternatives and grievances alike (Tjosvold, 1995).

McDaniels & Gregory (1991) summarize several important effects which culture can have on decision-making processes:

- Culture can affect problem definition, which might change what type of problem is apparently at issue.
- Culture can affect problem definition by providing standard operating procedures and information processing routines.
- Cultural norms that regulate control beliefs may influence the generation of alternatives before and after a choice.

- Culture can encourage decision makers to take strong positions, or to be vague and ambiguous.
- Culture may encourage individuals to be more concerned with process (e.g. consensus) than with decision quality.
- Culture may influence risk-taking patterns or affect trade-off between risk and return.
- Culture may guide patterns of reward and punishment, which may affect what individuals do to make the situation more favourable (i.e. risk adjustment).

## 2.4 Measurement of Cultures

There is considerable debate over whether cultures can be measured effectively using quantitative methods. Bhimani (2003) lists authors who have expressed positions on either side of this debate. Among those who feel quantitative methods are not sufficient to measure culture are Louis, (1983); Smircich, (1983); Schein, (1985); and Frost et al., (1991). Schein (1996a: 229) said, “culture needs to be observed, more than measured.” Others, however, feel that quantitative methods can reveal significant and relevant observations about cultures. Bhimani (2003) develops a list of those who share this standpoint; it includes Wilkins & Ouchi, (1983); Saffold, (1988); Siehl & Martin, (1988); Hofstede & Neuijen, (1990); Rousseau, (1990); and Zammuto & Krakower, (1991). We take the position of the latter group, feeling that statistical methods have an advantage in their efficiency. When coupled with a respectful awareness of cultural circumstance, and in conjunction with additional qualitative inquiry, these methods can provide a wealth of knowledge about organizational cultures.

One of the most influential works on measurement of cultures is that created by Hofstede (1980, 1991) and Hofstede & Neuijen (1990). In the former,

Hofstede's IBM studies in early 80's developed four dimensions of variance in national culture systems. These were, Power Distance (large vs. small); Uncertainty Avoidance (strong vs. weak); Individualism vs. Collectivism; and Masculinity vs. Femininity. Hofstede and Bond (1988) identified a fifth dimension that is useful: so called "Confucian Dynamism" (long-term vs. short-term orientation to life and work). These dimensions have formed the basis for numerous studies that deal with distinctions of national culture, such as Schwartz (1994), or Berco-vitch & Elgström (2001). These dimensions have also been the subject of much criticism and debate, but remain in common usage currently. They do not, however, lend much directly to the study of subcultures within organizations.

With culture being a concept that is difficult to define exactly, there exist a large number of proposed scales and measures with which to report on it. Here are presented just a few of the scales and measures that we found to have been used recently for studying organizational cultures. The Collective Self-Esteem Scale has been used to compare departments within an organization (Luhtanen & Crocker, 1992, described in Sato & Cameron, 1999). Two related scales; the Individualism and Collectivism Interpersonal Assessment Inventory (ICIAI), and the Status Differentiation Scale (SDS) as described in Matsumoto et al. (2002) are based on the work of Hofstede (described above) and were used to measure cross-national organizational cultures. The Organizational Culture Assessment (OCA) measures organic versus mechanistic cultures. It measures on five items,

Language; Artefacts and symbols; Patterns of behaviour; Espoused values; Beliefs and underlying assumptions (Reigle, 2001).

Gregory (1983) lays out three dimensions for classifying cultural paradigms. These may be more applicable to the variations we would see between subgroups of an organization. The first dimension she calls Holistic–Particulate and it refers to whether a culture paradigm understands cultures more as an integrated system or rather tends to look at particular traits of cultures without much concern for context. The second dimension is Explanatory–Interpretive, and spans the range from looking for causal relations or co-varying patterns (a structural-functional outlook) to describing and interpreting the whole (a “configurationist” perspective). The third dimension follows Malinowski’s (1922) conception of External-view versus Native-view points of view. Malinowski says the goal of ethnography is “to grasp the native’s point of view, his relation to life, to realize his vision of his world.” This third dimension is particularly salient, we feel. When trying to understand why cultures create the behaviours that they do, it is important to try to grasp what the members of a culture are seeing, thinking and feeling (though it may be difficult for them to express these ideas as they may have limited awareness of their own perception and thought patterns).

In a related vein, Dougherty (1992) attempted to assess departmental interpretive differences by collecting data about new product efforts in five firms. She conducted 80 interviews in different departments of the five firms. The study shows that, “the styles in which people organize their thinking and action about

innovation—their ‘interpretive schemes’—are major barriers to linking and collaboration [within a firm].” After dissecting the qualitative data, Dougherty distils three themes that distinguish how the thought worlds interpret the problems associated with bringing new products to market. These are,

“(1) what people see when they look into the future, including issues that are most uncertain; (2) what people consider to be the critical aspects of the product development process; and (3) how people understand the development task itself. By looking ... through the unique combination of the themes, people in each thought world understood the product in qualitatively different ways. Each thought world had an ‘intrinsically harmonious’ perspective on the product which did not overlap extensively with perspectives held by other departments.” (Dougherty, 1992: 187)

Sackmann (1992) used inductive reasoning to study four types of knowledge shared by organization members. Based on the type of knowledge possessed, She was able to identify “a number of cultural sub-groupings”, as well as “an organization-wide cultural overlay” (p. 140). The data from her study were collected during more than fifty interviews conducted with employees in three divisions (geographically and functionally disparate) of the same firm. Sackmann uses knowledge type as the distinguishing characteristic that allows her to identify organizational subcultures, and does so because she,

“sought more generic constructs that would capture the essence of culture from an interpretative or cognitive perspective while reflecting the commonalities underlying the various concepts in use.”

It is unfortunate that the four types of knowledge that she relies on in her study do not embody any more of the essence of culture than do the other con-

structs she rejects (such as ideologies, basic assumptions, values, practices, or collective will) in her study. It is true that as a construct, Sackmann's knowledge types are less ambiguous than other constructs used to measure culture. Still, we must recognize that she has successfully captured another facet of culture—one that has not been paid much attention as yet.

Hofstede (1998) revisits the topic of organizational cultures—and specifically subcultures—in a later paper that follows up a study performed in 1985-86. This is quite an important work in the present context because it is one of a very few empirical studies that investigates the presence of subcultures within organizations. In this 1998 work, Hofstede studies *a posteriori* the data collected in the mid-eighties. The data used were drawn from questionnaires completed by almost 2600 of 3500 employees from a large Danish insurance firm. The questionnaire contained 120 questions about attitudes, values, and “culture” questions about practices. 131 working groups were identified within the sample, and data were analyzed at the group level. Groups were compared across six dimensions of culture that had been indexed in a separate, previous study (Hofstede & Neuijen, 1990). Hofstede was able to categorize the 131 working groups into three subculture types: professional, administrative and customer interface. The index used here is intriguing. Based on Hofstede & Neuijen's (1990) sample that spanned twenty work units in ten organizations in Denmark and the Netherlands, it would appear the index takes into account different types of organizations, and unit cultures that exist in different hierarchical strata. Where the original data included

information about work units' attitudes, values, and practices, the index that is used by Hofstede in the 1998 study scores responses on practices only. Attitudes and values are not taken into account. Thus the six dimensions of culture underlying his study are measured by eighteen 'key' questions related to respondents' practices. Hofstede's model here is good, and with a small number of questionnaire items it is easy to implement. Unfortunately, even given a very large data set he was able only to discern three rather generalized subcultures within an organization: Professional, administrative, and customer interfacing. A manager faced with the need to make policy decisions may well desire more detailed information about the subcultures present in his or her organization.

One of the more interesting measures we have found is that developed by O'Reilly et al (1991). While its original instrument of delivery (Q-sort method) is cumbersome, we feel it can be adapted for use with a much simpler questionnaire methodology. We discuss the Organizational Culture Profile in more detail in section 3.5. First let us review how the values a person holds are a reflection of that person's cultural identity.

#### **2.4.1 Values as a Measure of Culture**

This project proposes to develop culture profiles of several groups within an organization. To the observer, culture is a subjective matter and depends on individuals' biased perceptions of cultural artefacts. Cultural artefacts take the form of objects or actions (i.e. behaviours) and are created by a culture's members, who are guided by underlying assumptions and espoused values. This is the

assertion of Schein (1992), which we will discuss in the next section. It would be equally possible to study culture from a qualitative or quantitative standpoint, however qualitative methods tend to be demanding of time, money and research resources. One of our objectives is to simplify the method by which cultural profiles can be developed; and this means basic quantitative methods and a questionnaire instrument are preferred.

Values are central to understanding corporate cultures and subcultures. They are inextricably tied to the psychological process of identity formation (Ashforth & Mael, 1989). Individuals naturally try to make for themselves a meaningful identity that connects them to the other people around them. This is the process that leads to the formation of social groupings, as people self-classify into groups. There is a sizeable body of research already in existence that attempts to quantify values. This gives us confidence that profiling values is both possible and convenient to accomplish using a questionnaire format. In order to understand exactly why values are a good measure of culture, we must also explore the ideas of two authors in particular: Edgar Schein and Geert Hofstede.

#### **2.4.1.1 Schein's ideas about culture**

Perhaps the most influential definition of culture of late has been that espoused by Edgar Schein, a prolific researcher, writer, teacher and consultant specializing in organizational cultures:

“I am defining culture as the set of shared, taken-for-granted implicit assumptions that a group holds and that deter-

mines how it perceives, thinks about, and reacts to its various environments” (Schein, 1992).

“Norms become a fairly visible manifestation of these assumptions, but it is important to remember that behind the norms lies this deeper taken-for-granted set of assumptions that most members of a culture never question or examine. The members of a culture are not even aware of their own culture until they encounter a different one” (Schein, 1996a).

Schein proposes three levels of culture, layered like an onion. The top layer consists of manifest, visible, tactile artefacts that are easy to experience but hard to decipher. These artefacts can be physical objects, or they can be actions and behaviours performed by members of the culture. Artefacts are easily visible to an outside observer, but may at some times seem to be at odds with the second layer of culture. This second layer consists of espoused values and ideologies that are “put forth as the explicit reasons why things are done the way they are, and a) are moderately visible; b) include ideology; c) are at times openly debated” (Schein, 2001). As mentioned above, they may not always correspond with individuals’ actual behaviours (Cf. Argyris’ (1990) concept of “theories in use”). The third layer forms the core of culture. It embodies shared, tacit assumptions about how things are and how things should be. These assumptions are mostly hidden from view, to both insiders and outsiders alike.

Shared basic assumptions, which include language and other common systems of communication, are what permit functioning at a conceptual level. Schein (1992) indicates that these assumptions have the following characteristics. Shared basic assumptions,

- Are born out of a shared history of experience;
- Are taken for granted;
- Operate outside of awareness;
- Are a defining property—that is, they allow differentiation between groups;
- Are self-reinforcing (successes prove their worth);
- Are awkward to discuss—generally a ‘discussion’ of these basic assumptions will generate a defensive posture.

Based on this idea of shared underlying assumptions, Schein develops the following formal definition of culture: Culture is,

“a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (Schein, 1992).

Unfortunately, Schein also says it is difficult or impossible to study a culture’s core values (shared basic assumptions). Members of a culture take these values for granted, and are usually not aware of how they operate to guide daily life and interaction. It is the second-layer Espoused Values that are observable. Though these are not necessarily identical to the deepest assumed values of a culture, they will certainly be concordant with them.

#### **2.4.1.2 Hofstede’s ideas about culture**

Consider now the view of culture taken by Hofstede, another influential researcher of organizational culture, since his writings indicate that culture of different forms varies in predictable ways. Hofstede posits that four terms borrowed from anthropology can cover the total concept of culture. They are symbols, he-

heroes, rituals, and values. These four terms are arranged into another onion-style model. Symbols form the most superficial manifestations of a culture, heroes and rituals each form deeper layers, and values form the core.

“Symbols are words, gestures, pictures, or objects that carry a particular meaning within a culture. Heroes are persons, alive or dead, real or imaginary, who possess characteristics highly prized in the culture and who thus serve as models for behaviour (Wilkins, 1984). Rituals are collective activities that are technically superfluous but are socially essential within a culture—they are therefore carried out for their own sake” (Hofstede & Neuijen, 1990).

The outer three layers (symbols, heroes, and rituals) can be grouped together. Hofstede labels these three “practices.” Practices are visible to outside observers, although their cultural meaning is not always accessible to outsiders. The meaning of a culture’s practices depends on the way they are perceived by insiders.

“The core of culture... is formed by values, in the sense of broad, non-specific feelings of good and evil, beautiful and ugly, normal and abnormal, rational and irrational—feelings that are often unconscious and rarely discussable, that cannot be observed as such but are manifested in alternatives of behaviour” (Hofstede & Neuijen, 1990).

The ideas expressed by Hofstede and Schein in defining culture are similar. Both agree that the core or foundation of culture is a set of values shared by a group. Around this core a group builds layers of culture that consist of more visible artefacts. Both men express the idea that the artefacts (including behaviours) created by members of a cultural group are an important element of culture, not to be overlooked. It must be understood that these artefacts allow for a confirma-

tory feedback loop wherein culture's artefacts are a physical manifestation or expression of core values, while at the same time those core values are confirmed and reinforced by the presence of cultural objects and the performance of culturally mandated behaviours. The outer layers of culture differ slightly in Schein and Hofstede's views. Hofstede borrows from ethnology and defines three outer layers (symbols, heroes, and rituals) that together called Practices. Schein would argue that all of those practices are subsumed into his outer layer, which he simply called artefacts. Though Schein does not distinguish between different sorts of artefacts, he does offer an important insight into culture with his layer between the outer artefacts and the inner values. This mid-level layer represents espoused values, and it is this layer that is most interesting to our proposed research. We will examine its value in the context of the current research below.

But we are not yet finished with Hofstede. The most important revelation that he makes is the idea that in the organization setting *cultures vary more in their practices* (symbols, heroes, and rituals) *than they do in their values*, and that organizational culture is best understood not as a shared set of values as much as "shared perceptions of daily practices" (Hofstede, 1991, 182).

According to Hofstede, national cultures differ mainly on values, and little on practices. At the other end of a continuum, he says organizational cultures differ mainly on perceptions of shared practices, and little on values (Hofstede & Neuijen, 1990). Of course, values will differ slightly between organizations, but since values are socialized at home during childhood and practices are socialized

in the workplace, it comes as no surprise that most workers with similar nationality will share fundamentally similar values, yet differ to a greater degree in their practices according to their workplace. Figure 2 describes this idea graphically.

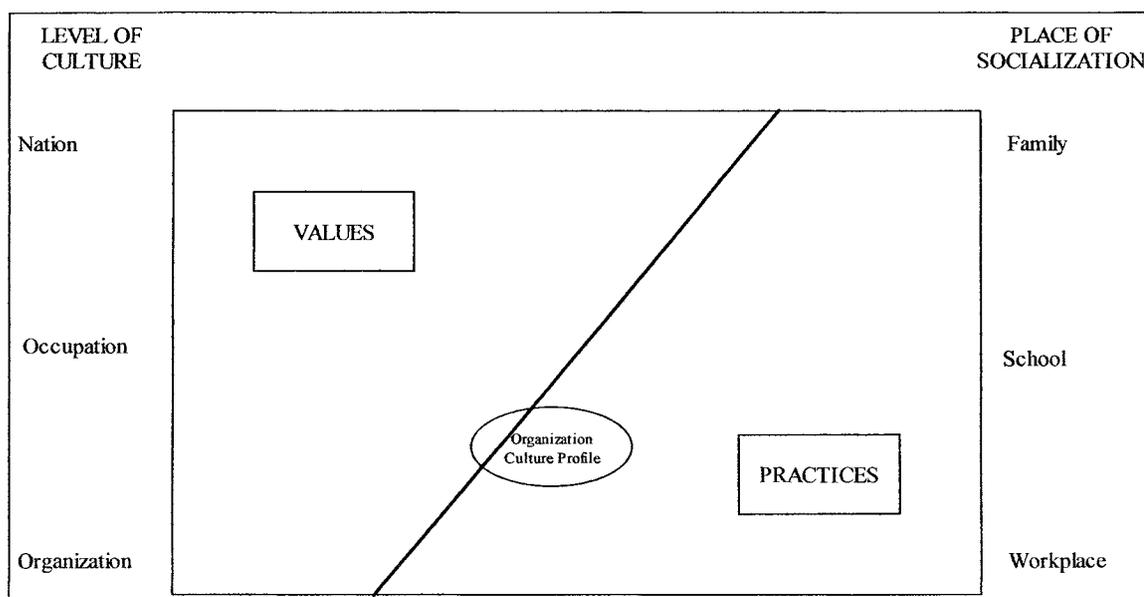


Figure 2: Positioning of the OCP and the nature of cultural differences: national, occupational, and organizational levels (adapted from Hofstede, 1991).

### 2.4.1.3 Practices vs. Values

The obvious question is this; why are we proposing to measure organizational subcultures based on their values? The answer can be arrived at by combining the ideas of Schein and Hofstede: In a sense, Schein's Espoused Values occupy a unique position wherein they somewhat straddle the boundary between what Hofstede would call Values and what he would call Practices. Espoused Values share some elements of each concept and are fundamentally tied to both. In addition, the (unobservable) "core values" denoted by both Hofstede and Schein differ from the work-related values probed by the OCP. We will discuss the ques-

tionnaire in more detail below, but for now suffice it to say the “values” queried in the questionnaire are quite similar to Schein’s definition of Espoused Values in that they are, a) moderately visible; b) attached to ideologies; c) able to be openly debated (Schein, 2001). What’s more, many of them are framed in terms of ordinary daily practices, or normative actions. For example if trying to determine a subject’s value for timeliness, we would ask a question about how much he values being on time. Similarly, if the value we desire to measure is attention to detail, we would ask how much importance the subject places on being precise, paying attention to detail, and being analytical. The questions are framed in terms of actions. We interpret the responses as painting a picture of espoused values. All this points to one outcome: Taking espoused values as a measure of culture is a good compromise between having an accurate indicator of the “true” underlying values and the ease and practicality with which that indicator can be observed and analysed.

## **2.5 Organizational Culture Profile**

O’Reilly et al. (1991) developed an instrument to generate an Organizational Culture Profile. Its purpose was to profile culture in a given situation for use in comparing persons to situations. From this comparison they were able to quantify person-situation fit. They developed a list of 54 ‘values’ that differentiate organizations:

“To assess organizational culture, we used the Organizational Culture Profile (OCP) which is based on the Q-sort profile compari-

son process (Bern & Funder, 1978; Block, 1978). In a Q-sort, respondents are presented with a large number of items and asked to sort them into a specific number of categories based on some criterion. The OCP contains 54 "value statements" assessing attitudes toward, for instance, quality, respect for individuals, flexibility, and risk taking that emerged from a review of academic and practitioner-oriented writings on organizational values and culture. Thirty-eight business administration majors and four business school faculty members screened an initial 110-item deck for items that were redundant, irrelevant, difficult to understand, or omitted. A similar check was made with an independent set of respondents from accounting firms. After several iterations, a final set of 54 values was retained" (O'Reilly et al., 1991).

The OCP has been quantitatively assessed and seems to have good reliability and validity.

"A number of tests have been conducted to assess the reliability and validity of the OCP. Test-retest reliability over a 12-month period was quite high (median  $r = .74$ , range =  $.65-.87$ ). To avoid social desirability bias, O'Reilly and colleagues cast the OCP items in neutral terms, and comparisons to an empirically derived profile of social desirability revealed that firm informants did not sort the items in ways that made their firms look good (Chatman, 1991). In addition, convergent validity has been established through the significant positive correlation ( $r = .28$ ,  $p < .05$ ) between person-organization fit assessed with the OCP and normative commitment defined as attachment to an organization based on value congruence (O'Reilly et al., 1991)" (Chatman & Jehn, 1994).

Where O'Reilly and others used the OCP to develop a picture of the whole organization, we believe that it could be equally useful to develop snapshots of subunits of the organization, and that these subunits can be numerically compared. Furthermore, the delivery instrument used by O'Reilly et al., a technique involving the sorting of a deck of cards, is undesirable for two reasons: First, the Q-sort method is time consuming and demanding of the respondent's classifica-

tion abilities. Second, the Q-sort method constrains the available choices given to the respondent, and forces an “unnatural” distribution of responses. For these reasons, we have elected to translate the OCP to a questionnaire format using Likert-type scales for each item in the questionnaire.

### **3 RESEARCH QUESTION**

The literature review presented above should make it obvious that culture, as a concept, is neither simple nor can it be clearly defined. Also it should be apparent that what we discussed above as determinants and impacts of culture can very often become intertwined—some of culture’s creations can turn around and influence culture. This leads to a somewhat circular concept, similar in nature to the conceptual framework presented earlier in this work. As we discussed earlier, it is not too great a leap in logic to see how the environment affects cultures, and how they, in turn, impact back on the environment. Schein (1992) depicts a similar circle when he discusses artefacts (that is, actions) as being directed by underlying assumptions and espoused values; but those same “fundamental” assumptions can be changed over time by routinized actions (determined in part by external factors) causing shifts in espoused values, which gradually become taken for granted.

In order to simplify the situation somewhat, we grasp for a common thread that runs through practically all understandings of culture; that is, the idea that *values* underlie cultures in all situations. We can seize on this idea while at the same time recognizing that by studying values we may be developing an incomplete picture of people’s true cultures (since, as mentioned above, culture is the sum of more than just people’s values). However, our objective is to identify distinct subcultures in one organization and, to that end, measuring values ought

to be sufficient. In this thesis the need is to deal with subcultures in a way that allows us to separate them while gathering insight that might be of use to managers. By focusing on values, and specifically work-related values, we can develop limited profiles of multiple subcultures within the target organization.

We look for clusters of people within the organization who share related sets of values (in this case, work-related values or practices). Do people form clusters like these along the lines of their role groups? It would be of great potential value for managers to determine whether these subculture groups form around similar job descriptions, work venues, ethnic groups, hierarchical levels, or the like. If we assume the framework presented in 2.4 to be true, then understanding employees' values allows understanding why and how certain decisions and behaviours come about. Conversely, managers need to appreciate that altering business practices will impact work-related values as predicted by Schein (1992) for better or for worse. Knowing that people's values lead to the creation of a certain worldview, and that worldview impacts on decision making, it stands to reason that subcultural differences are important in the day-to-day functioning and long-term health of any organization. Going beyond this generalized understanding, while undoubtedly important, is beyond the scope of this thesis. Our essential research question is this: Are differences in organizational subcultures large enough to be detected with our instrument in a medium-sized organization? That is, can we detect such differences by measuring the value priorities that people report for their work unit by using the value set borrowed from the OCP?

We have tried to design a questionnaire that is sensitive to how different groups will report the importance of certain behaviours; this should give us a window on espoused values (Schein, 1993). Note that the espoused values may be different than the “values-in-use” (Argyris, 1990), and a qualitative follow-up proved very enlightening.

## **4 METHODS**

The OCP is a relevant measure of organizational culture, which is based on items that ought to be equally applicable to organizational subcultures. Its original delivery format (Q-sort method) is cumbersome and difficult to implement. If a better (faster, cheaper) method of delivery could provide information about organizational subcultures, then we feel this could be of great utility to managers. Accordingly, the research undertaken during this project used a questionnaire format as a relatively simple method of presenting the OCP value set and gathering response data.

### **4.1 Research Design**

In cooperation with the University of Ottawa Heart Institute (hereafter: Heart Institute), we have undertaken a quantitative study of Heart Institute employees by distributing a questionnaire. Dr. Jim Robblee, Chief of Cardiac Anaesthesia for the Heart Institute, kindly undertook the role of Principal Investigator as required by the Heart Institute and collaborated with the author to assist in obtaining ethical clearance by the Heart Institute's Research Ethics Board. Dr. Robblee also coordinated distribution of the questionnaire within the Heart Institute. It was mutually decided that the sample should be a total sample. Three attempts were made to include all staff working at the Heart Institute, except certain ancillary staff (such as those in the cafeteria and gift shop) but including all

housekeeping staff. Distribution was complicated by the fact that most Heart Institute staff members are not employed by the Heart Institute *per se*, but are either employees of The University of Ottawa, or The Ottawa Hospital while being permanently attached to the Heart Institute. Thus there is no centralized office with control over matters of human resources that could take responsibility for distribution of the questionnaire. In fact, it was an interesting but difficult task simply to develop a complete list of staff members. A mix of managers, supervisors and certain more senior staff were informed by Dr. Robblee as to the importance of the study to the Heart Institute in the hope that these individuals would speak favourably about the study to their peers and subordinates, thereby increasing desire among staff members to participate in this research effort. The researchers suspected that the Heart Institute already had a "culture" of such volunteerism. At the outset, we were confident that framing this research in the proper context would ensure a reasonable participation rate. Unfortunately, final participation rates were somewhat less than had been hoped for.

The University of Ottawa Heart Institute was selected as the target organization for this investigation for several reasons. The Heart Institute is a medium-sized organization whose membership is made up of a very wide variety of employees. There are professionals of several varieties; most are medical but many are technical in their orientation. These professionals have experienced different types and styles of training as well. The employee set includes non-professional career paths too: clerical staff, administrative staff, secretarial staff, drivers, back-

room supply workers, front-desk and telephone-based customer service are all represented. In short, a broad mix of employee roles and demographics is present in the Heart Institute. This should provide a rich “playground” for our study. Intuitively it was expected there could be several “strong” subcultures inside this organization.

## **4.2 Administration of the Questionnaire**

A reasonably short questionnaire was developed. It contained all fifty-four items of O’Reilly et al.’s OCP value set. The questionnaire also contained some items to collect demographic information on respondents so we can check for correlations between culture and various demographic factors (gender, age range, self-reported “ethnic identity,” as well as functional specialization (job role) and work unit membership within the target organization). The questionnaires were intended to be anonymous and could not be traced back to a particular respondent. In the interest of protecting subjects’ identities, groups populated by five or fewer subjects in the sample are not reported.

The questionnaire was developed in English and translated into French by a private, third party document translation service that regularly handles English-French translation for the Federal Government. Several translators working independently first translated the questionnaire into French, and a final translation was arrived at by consensus. Another translator who had not seen the original English document then back-translated the French version of the questionnaire to English. This back-translation allowed for comparison with the original

English version to try to detect any major problems with translating the concepts referred to in the questionnaire. We found no such problems.

An exact count of the number of employees at the institution was never obtained, since the staff members at the Heart Institute belong to three different organizations: The University of Ottawa, The Ottawa Hospital, and the Heart Institute itself. In addition, there are some employees contracted from third-party companies. However, even though there are several employers involved, nearly all staff members are permanently attached to the Heart Institute. The noteworthy exceptions are part-time or casual nursing staff that, in addition to working at the Heart Institute, may work part-time in other locations or in other capacities. Even though staff members at the Heart Institute might identify themselves as belonging to these other organizations, and while the Heart Institute staff are represented by three separate labour unions, we remain fairly confident that the majority of staff possess strong role identification as belonging to the Heart Institute. This is for two reasons: First is the fact that almost all the staff is permanently attached to the Heart Institute, meaning their physical workspaces and work-related duties are unrelated to other 'parent' organizations (Ottawa Hospital, and University of Ottawa). The Heart Institute is their *de facto* employer. Anecdotal evidence supports this conclusion. Second, it should be noted that the Heart Institute has an unusually low rate of staff turnover, and a high number of staff who have been at the Heart Institute a great many years (twenty years' tenure or more is common). Therefore we can be confident that the Heart Institute

staff will have generally strong identification with the organizational culture(s) of the Heart Institute, notwithstanding membership in other organizations (university, hospital, and labour unions).

UNION MEMBERSHIP	FULL TIME	PART TIME	CASUAL	totals
Canadian Union of Public Employees	82	43	23	148
Ontario Nurses Association	197	139	25	361
Ontario Public Service Employees Union	78	25	42	145
Administrators (non-union)	39	4	5	48
totals	396	211	95	<b>702</b>

Table 2: Best available estimates for number of employees as at date of questionnaire distribution.

The questionnaire, in both English and French, was distributed along with a pre-printed return envelope and a standard letter of information. Efforts were made to provide one copy of this package to each full-time, part-time, and casual staff member of the Heart Institute. The approximate sampling frame was close to seven hundred individuals. A 30% response rate (n= about 210) was desired since that number would already give fairly low statistical power in the ensuing analysis once the sample is separated into subgroups for comparisons. Respondents who chose to participate returned their completed questionnaires in the provided envelopes to the office of the Principal Investigator. Inter-office mail was used for this purpose, and some strategically placed drop boxes were provided for clinical staff that might not have easy access to inter-office mail services.

### **4.3 Qualitative Follow-Up: Interviews**

It was decided early in the process of implementing the questionnaire that a qualitative follow up would benefit the analyses of the quantitative data. By meeting a handful of the staff face-to-face we could affirm or refute interpretations of the questionnaire data. Open-ended interviews allowed greater depth of exploration as to the sources of perceived similarities and differences of subcultures within the organization. A target number of about ten interviews was chosen. This was deemed sufficient to allow contact with the various subcultures that were appearing in the questionnaire returns. We elected to use an open interviewing technique that focussed on issues, much like the technique used by Dutton & Duncan (1987) and Sackmann (1992). The rationale for this strategy is threefold: (1) discussing issues creates a stimulus for drawing out culture-specific cognitions. (2) Limiting discussion to just a few issues sets manageable boundaries on a potentially broad exploration. (3) Discussing at least one common issue with each respondent ensures that we have a common reference point for comparing cognitions across individuals and/or groups.

The interview subject was asked to suggest two or three issues that he or she thought were important in the recent history (three to five years) of the Heart Institute. The researcher was also armed with a pre-selected list of four major changes and events in the recent history of the organization. By discussing either or both of the respondent's chosen issues and the researcher's chosen issues, a broad base of comparison was possible between subjects. In addition to an issue-

based line of questioning, the interview also involved some probing questions about interactions among groups within the organization. While there were many pre-selected questions available to the researcher, these served only as a guide and each interview followed a natural course of discussion, guided by the researcher, to ensure as complete a picture as possible was developed for each subject. We sought to identify their particular point of view in matters of subcultural interactions within the organization.

## **5 OUTCOMES AND ANALYSES**

### **5.1 Outcomes**

#### **5.1.1 Questionnaires**

Over a period of about three weeks, the questionnaire was put into the field and follow-up reminder letters were distributed twice along with additional blank questionnaires in both official languages. A total of one hundred thirty useable questionnaires were returned by the end of this period, representing just fewer than 20% of the total possible sample. While a 20% response rate might be considered to be good under some circumstances, it was our hope that this particular sample population, having a professional orientation toward a 'culture of helping', and also consisting of members of a research facility ostensibly receptive to research initiatives, would participate to a greater degree than it did. It was an unfortunate and unforeseen coincidence that distribution of our questionnaire followed closely on the heels of a staff satisfaction survey undertaken by the Heart Institute and the Ottawa Hospital. We suspect that there may have been confusion among the staff leading to a lack of differentiation between the two questionnaires. Some items on the two questionnaires dealt with similar subject matter, and the page layout of the two surveys, while far from identical, did have some similarities. Furthermore, there may have been "survey fatigue" whereby already busy staff members found the duty to reply to two questionnaires overly burdensome. Certainly the Heart Institute is a busy and efficient organization

and staff members have little time to devote to ‘non-essential’ tasks like completing surveys.

Type		Frequency	Percent	Valid Percent
Valid	CLINICAL RESCH COORD	5	3.9	4.2
	PHYSICIAN	10	7.9	8.3
	R.N.	65	51.2	54.2
	THERAPIST	5	3.9	4.2
	TECHNOLOGIST, TECHNICIAN, DIAGNOSTICIAN	6	4.7	5.0
	ADMIN SUPPORT	15	11.8	12.5
	OTHER SUPPORT	5	3.9	4.2
	OTHER MISC.	9	7.1	7.5
	Total	120	94.5	100.0
Missing		7	5.5	
Total		127	100.0	

Table 3: Frequency of questionnaire responses by role

The distribution of responses received was less than ideal for the analyses proposed in this research. Obviously, a larger sample would have enabled us to subdivide for inter-group comparisons with more statistical power and confidence. However we still are able to make use of the data collected for interesting analyses. Approximately half of the responses received were from nursing staff, which is on par with expectations, since about half of Heart Institute staff are in nursing roles. Administrative-type roles and physicians represented themselves well in terms of response rate, however absolute numbers of these role types is small, making statistical comparisons impractical in most cases. Other role types were poorly represented, or failed to return any questionnaires at all. In particular, staff members from the research arm of the Heart Institute are notably absent (only one questionnaire returned). Housekeeping staff and supply workers

are not represented at all. This is disappointing as it deprives us of opportunities to make comparisons.

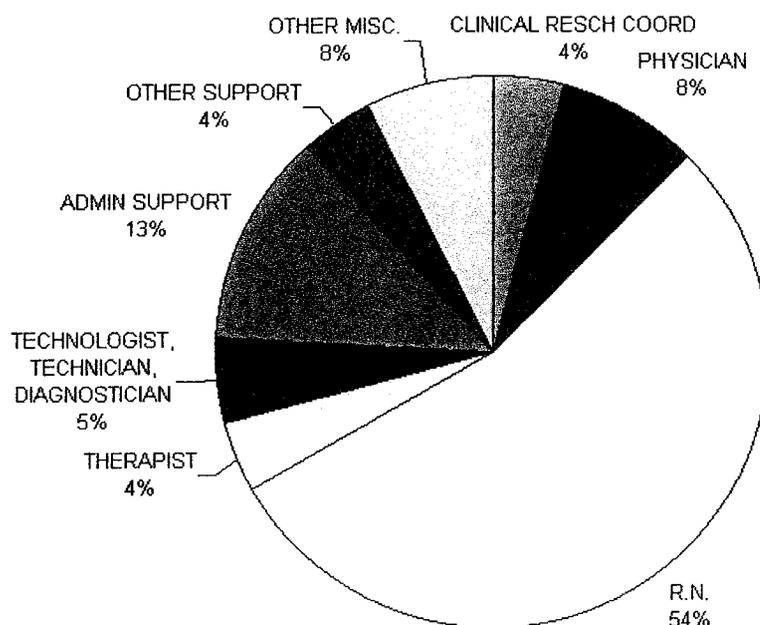


Figure 3: Distribution of questionnaire responses by role

Perhaps this same absence of representation for certain groups of employees is a fact worthy of further consideration. It is possible that certain groups' lack of responses can be attributed to difficulty in either accessing or returning the questionnaires, however we think these not to be the case. More likely, individuals in these groups chose not to participate in the research. We must therefore ask: why? Did they think this research did not apply to them? Did they feel their contributions would not be valued? Was this because they undervalued their own input or because they felt that their input would be undervalued by others? Did their work have priority over devoting time to completing a questionnaire? Did anyone fear repercussions if participation in this research got in the way of

performing their other duties? The very fact that groups of responses are systematically missing is intriguing in its own right. It is very possible that there may be subcultural reasons related to the decision an individual had to make when choosing whether to participate in this research. It might be of interest to the Heart Institute to further pursue the role groups that are not represented in this sample, in order to determine if there was a systematic cognitive factor related to participation.

Given the breakdown of who replied to our questionnaire, we divided the sample into three groups for analysis. These were, Nursing (n=72), Administrative (n=20), and Others (n=38). This allowed us to compare two groups, Nurses and Administrators. The group sizes are markedly different, but various techniques that will be described below allow us to sidestep this problem. Alternatively, we also tried some explorations with Nurses compared to *all* other employees pooled together. This yielded two much more like-sized groups for comparison: (n=67) nurses and (n=58) all others. A third method of grouping respondents, which never amounted to much statistically, was to separate respondents in this fashion: Clinical (doctors and nurses both, n=82), Clerical and Support (n=28), Technical (n=7).

### **5.1.2 Interviews**

Of the nine staff members who volunteered to participate in hour-long interviews, seven subjects ultimately made themselves available. Interviews conducted with these seven staff members proved to be informative and very inter-

esting. Each of the seven participants had a different role within the organization, Individuals involved represented the clinical, administrative, and research arms of the organization. Similar themes emerged from most of these interviews, and a more detailed analysis follows later in this document.

## **5.2 Data Analyses**

Responses from the questionnaires were tabulated and quantitative analysis performed using SPSS and several univariate and multivariate procedures. Collected data were aggregated and analyzed in an effort to identify discrete patterns of important values reported by respondents in different departments or functional roles within the Heart Institute. Patterns of values were also checked for association with other independent variables such as age range and gender.

### **5.2.1 Exploring the Data**

The SPSS “Explore” command generates a series of tests that can tell us about the data, and whether certain assumptions are met: These are things like variance, normality of distribution, and more. We can also see if there are any extreme cases, outliers, or otherwise unusual observations. Exploring the data can help to determine whether the statistical techniques that we are considering for data analysis are appropriate. For example, we might determine that non-parametric tests are warranted for testing certain data. By exploring the data, we can also begin to see possible correlations among the variables.

Comparisons between genders are difficult with this data set because a small number of males (n=23) relative to females (n=107) gave responses. Also, the variance is not equal for men's and women's responses on a great many items. However, we are able to make valid comparisons by subjects' age range, but neither significant nor systematic differences in response patterns can be seen in connection with the age of respondents.

For the most part, education levels have only slight association with the importance of different values reported by the organization's membership. We need to remember that education level is intercorrelated with role group in our sample, so making inferences based on education level alone is unwise in this hospital setting. That being said, we can easily see that education is related to the weighting that subjects placed on certain values (reported here in alphabetical order):

- *Being Socially Responsible;*
- *Decisiveness;*
- *Low Level of Conflict;*
- *Working in Collaboration with Others.*

Continuing to use the SPSS Explore command on our data set we can see that there might be other interesting differences in the way groups of subjects indicate importance of value items. For most of our 54 value items, variance is relatively uniform, which is reassuring for the validity of the many tests we can perform on the data. Still, there are a number of items for which variance is non-uniform. That means that relying on a simple ANOVA test could be misleading. For this reason, we also use here a non-parametric procedure: the Mann-Whitney

U test (or the very similar Wilcoxon W). This is essentially a non-parametric equivalent of the *t*-test.

**5.2.2 Comparing Groups—ANOVA Procedures and Non-Parametric Tests**

By using ANOVA procedures (see Table 4, page 76; and Table 5, page 77), screened by testing homogeneity of variance for each variable (see Table 6, page 77; and Table 7, page 78), and comparing the results with some non-parametric tests (see Table 8, page 78; and Table 9, page 78), we can be quite confident that there are indeed some differences between groups within the Heart Institute. What we did in this case involved using a standard ANOVA procedure. Of 54 items in our set of values tested, we see that the test groups differ significantly on eight to twelve of the items. Can we trust this initial evaluation? The answer depends on whether we've satisfied the assumptions about data quality required for using ANOVA procedures.

Item	F	Sig.
BEING SOCIALLY RESPONSIBLE	6.540	0.012
SECURITY OF EMPLOYMENT	8.079	0.006
FAIRNESS	6.313	0.014
BEING SUPPORTIVE	6.452	0.013
DECISIVENESS	4.205	0.043
WORKING IN COLLABORATION W/ OTHERS	9.461	0.003
RESPECT FOR INDIVIDUAL'S RIGHT	8.406	0.005
SHARING INFORMATION FREELY	8.595	0.004
BEING CALM	9.468	0.003
LOW LEVEL OF CONFLICT	5.628	0.020
DEVELOPING FRIENDS AT WORK	5.402	0.022
AUTONOMY	7.573	0.007

Table 4: ANOVA for nurses cf. administrators—items significant at  $\alpha \leq 0.05$

Item	F	Sig.
BEING SOCIALLY RESPONSIBLE	5.009	0.027
SECURITY OF EMPLOYMENT	11.063	0.001
BEING SUPPORTIVE	4.911	0.028
BEING DEMANDING	4.618	0.034
WORKING IN COLLABORATION W/ OTHERS	5.004	0.027
RESPECT FOR INDIVIDUAL'S RIGHT	5.500	0.021
WILLINGNESS TO EXPERIMENT	6.786	0.010
DEVELOPING FRIENDS AT WORK	7.659	0.006

Table 5: ANOVA for nurses cf. all others--items significant at  $\alpha \leq 0.05$

Item	Levene Statistic	df1	df2	Sig.
BEING SOCIALLY RESPONSIBLE	5.356	1	83	0.023
FAIRNESS	9.161	1	87	0.003
BEING SUPPORTIVE	9.788	1	87	0.002
BEING INNOVATIVE	6.560	1	87	0.012
WORKING LONG HOURS	4.899	1	86	0.030
HAVING GOOD REPUTATION	4.783	1	86	0.031
WORKING IN COLLABORATION W/ OTHERS	4.078	1	87	0.047
RESPECT FOR INDIVIDUAL'S RIGHT	5.254	1	86	0.024
SHARING INFORMATION FREELY	7.991	1	86	0.006
BEING CALM	7.104	1	87	0.009
BEING HIGHLY ORGANIZED	4.258	1	87	0.042
PAYING ATTENTION TO DETAIL	5.626	1	87	0.020
LOW LEVEL OF CONFLICT	8.303	1	86	0.005
FLEXIBILITY	6.700	1	86	0.011
BEING PEOPLE ORIENTED	4.663	1	86	0.034
TAKING INITIATIVE	4.888	1	86	0.030

Table 6: Items with non-homogenous variances--nurses cf. administrators

Item	Levene Statistic	df1	df2	Sig.
BEING SOCIALLY RESPONSIBLE	3.960	1	123	0.049
SECURITY OF EMPLOYMENT	10.598	1	127	0.001
BEING AGGRESSIVE	4.826	1	127	0.030
BEING SUPPORTIVE	7.100	1	127	0.009
WORKING IN COLLABORATION W/ OTHERS	4.667	1	127	0.033
SHARING INFORMATION FREELY	5.649	1	126	0.019
WILLINGNESS TO EXPERIMENT	4.620	1	127	0.034
NOT BEING CONSTRAINED BY MANY RULES	5.952	1	124	0.016
LOW LEVEL OF CONFLICT	11.875	1	126	0.001
BEING PEOPLE ORIENTED	8.595	1	126	0.004
DEVELOPING FRIENDS AT WORK	6.574	1	127	0.012
AUTONOMY	5.367	1	126	0.022

Table 7: Items with non-homogenous variances--nurses cf. all others

Item	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
BEING SOCIALLY RESPONSIBLE	439.500	629.500	-2.041	0.041
SECURITY OF EMPLOYMENT	372.000	562.000	-3.056	0.002
HIGH EXPECTATIONS FOR PERFORMANCE	461.000	651.000	-2.118	0.034
WORKING IN COLLABORATION W/ OTHERS	408.500	598.500	-2.692	0.007
RESPECT FOR INDIVIDUAL'S RIGHT	398.500	569.500	-2.496	0.013
SHARING INFORMATION FREELY	445.500	635.500	-2.190	0.028
BEING CALM	435.000	625.000	-2.377	0.017
AUTONOMY	355.000	526.000	-2.915	0.004

Table 8: Non-parametric tests--nurses cf. administrators--items significant at  $\alpha \leq 0.05$

Item	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
SECURITY OF EMPLOYMENT	1,419.000	3,130.000	-3.128	0.002
BEING DEMANDING	1,589.500	4,074.500	-2.134	0.033
WORKING IN COLLABORATION W/ OTHERS	1,631.500	3,342.500	-2.114	0.034
RESPECT FOR INDIVIDUAL'S RIGHT	1,546.500	3,199.500	-2.370	0.018
WILLINGNESS TO EXPERIMENT	1,517.000	4,073.000	-2.607	0.009
DEVELOPING FRIENDS AT WORK	1,563.000	3,274.000	-2.405	0.016

Table 9: Non-parametric tests--nurses cf. all others--items significant at  $\alpha \leq 0.05$

According to Stevens (2002) there are three assumptions that must be met regarding the data used in ANOVA procedures. These are, that the observations are independent; the observations are normally distributed on the dependent

variable in each group; and the population variances for the groups are equal (so-called homogeneity of variance). The first, and most serious condition, independence, is true for our data. We know this is true by virtue of the simple fact that the respondents answered questionnaires individually. Glass & Hopkins (1984) offer this explanation:

“Whenever the treatment is individually administered, observations are independent. But where treatments involve interaction among persons, such as discussion method or group counseling, the observations may influence each other.” (p.353)

The second assumption, normality of distribution, generally has only a small effect on type I error. However our data seem relatively ‘healthy’ in this regard too. Rather than skewness (a distribution with an elongated tail on one side or the other), kurtosis (peakedness—broad or narrow—of the distribution) is of greater concern since it can attenuate statistical power. There are a number of items in our set that suffer moderate skewness (unavoidable, we think when scoring items on a scale like our nine-point scale). There are none that suffer significant platykurtosis (flatness of distribution) that would attenuate statistical power.

The third assumption of ANOVA is homogeneity of variance. If group sizes are relatively equal, the  $F$  statistic we are measuring is quite robust to violation of this assumption. Therefore we should not worry too much when differences between group sizes are  $<1.5$ . In our data set, one comparison we make involves (n=67) nurses and (n=58) all other employees, so this comparison is relatively safe from violating the assumption. Our other comparison involves (n=67) nurses

being compared with (n=19) administrators. This comparison definitely violates the assumption of equal group sizes. Fortunately, SPSS provides a test for the homogeneity of variance (see Table 6, page 77; and Table 7, page 78) that can identify the specific items for which items this violation is of greatest concern. By using it we can check whether the items deemed significant by the ANOVA procedure violate the assumption of equal variance. If so, we have to weigh how much we can trust the result, and whether a non-parametric test should be used for further comparison.

Bearing in mind the limitations just discussed, we see that when comparing Nurses to all other employees of the organization, nurses report higher levels of importance for these values (in alphabetical order):

- *Being Demanding;*
- *Developing Friends at Work;*
- *Respect for Individual's Right;*
- *Security of Employment;*
- *Willingness to Experiment;*
- *Working in Collaboration with Others.*

When comparing nurses to administrators only, (the other role group with large enough numbers in our data set to make meaningful comparisons) we see that nurses report higher levels of importance for these values (in alphabetical order):

- *Autonomy;*
- *Being Calm;*
- *Being Socially Responsible;*
- *High Expectations for Performance;*
- *Respect for Individual's Right;*
- *Security of Employment;*
- *Sharing Information Freely;*
- *Working in Collaboration with Others.*

### **5.2.3 Principal Components Analysis**

In the present study, we are dealing with a set of 54 variables related to the construct “Culture.” It is unlikely and counter-intuitive that these represent fully fifty-four different and independent constructs. Instead it is probable that there exists some scheme to cluster or “hang together” these 54 variables into a smaller number of groups or factors. To do this we have the options of using *principal components analysis* and *factor analysis*. The basic logic of each involves deriving linear combinations of the original variables. Usually, a small number of these derived ‘factors’ will account for most of the variation in the correlations among the original variables. Factor analysis and principal components analysis often yield similar results.

We choose to use principal components analysis here for several reasons. As Stevens (2002) points out, principal components analysis is a psychometrically sound procedure; it is relatively simpler to perform than factor analysis; and factor analysis can provide only estimates of the factors while principal components transforms the original variables into new linear combinations of variables. This latter point will allow more intuitive interpretation of the derived components (we hope) as well as subsequent use of the components in a multiple regression context. Since the scales on which our variables are measured are arbitrary, it is preferable that we extract components from a correlation matrix (as opposed to a covariance matrix that would otherwise be preferred).

Prior to running principal components analysis, two measures were made to check that the set of 54 variables do indeed co-vary. This is important since co-variance indicates that some of the variables are, in part, describing the same phenomena. If that is true, then looking for groupings (factors or components) of variables is a worthwhile endeavour. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO), and Bartlett's test were performed.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.852
Bartlett's Test of Sphericity	Approx. Chi-Square	4,577.539
	df	1,431
	Sig.	0.000

a. Based on correlations

Table 10: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO), and Bartlett's test

Results from each test suggest that the set of 54 items is a good candidate for principal components analysis. As a confirmation that principal components extraction is returning reliable results, other parallel methods can be used to extract components from the set of variables. This list, with annotations drawn from SPSS v.12, presents the component extraction methods we have used to cross check the set of components derived in this study.

- ***Principal Components Analysis.*** A factor extraction method used to form uncorrelated linear combinations of the observed variables. The first component has maximum variance. Successive components explain progressively smaller portions of the variance and are all uncorrelated with each other. Principal components analysis is used to obtain the initial factor solution.
- ***Unweighted Least-Squares Method.*** A factor extraction method that minimizes the sum of the squared differences between the observed and reproduced correlation matrices ignoring the diagonals.
- ***Maximum-Likelihood Method.*** A factor extraction method that produces parameter estimates that are most likely to have produced the observed correlation matrix if the sample is from a multivariate

normal distribution. The correlations are weighted by the inverse of the uniqueness of the variables, and an iterative algorithm is employed.

- *Principal Axis Factoring.* A method of extracting factors from the original correlation matrix with squared multiple correlation coefficients placed in the diagonal as initial estimates of the communalities. These factor loadings are used to estimate new communalities that replace the old communality estimates in the diagonal. Iterations continue until the changes in the communalities from one iteration to the next satisfy the convergence criterion for extraction.

Each one of these above-named extraction methods was performed on the set of 54 items. In each case, the factors extracted were reasonably similar when compared subjectively. A direct comparison is difficult to perform on the initial set of factors, however, since unrotated factors are difficult to read and interpret. Therefore a varimax rotation was performed on each of the solutions. After rotation, the factors were easier to interpret, and indeed remained reasonably similar when compared subjectively. While the number, order, and constituent makeup of individual factors varied for each extraction method, the general “theme” of the factors that were extracted was substantially similar. Furthermore, the constituent makeup of factors remained largely the same in all cases. We can therefore be confident that using principal components factor extraction method to derive a set of factors is appropriate in this case.

Next it behooves us to assess the method of factor rotation. SPSS presents a number of different factor rotation schemes, and as varimax is the most commonly employed, we will use this as a point of comparison. Taking an initial solution extracted by means of a principal components method, a rotated solution

was derived with each of the following rotation methods (annotations are from SPSS v12 help files):

- *Varimax Method.* An orthogonal rotation method that minimizes the number of variables that have high loadings on each factor. It simplifies the interpretation of the factors.
- *Direct Oblimin Method.* A method for oblique (nonorthogonal) rotation.
- *Quartimax Method.* A rotation method that minimizes the number of factors needed to explain each variable. It simplifies the interpretation of the observed variables.
- *Equamax Method.* A rotation method that is a combination of the varimax method, which simplifies the factors, and the quartimax method, which simplifies the variables. The number of variables that load highly on a factor and the number of factors needed to explain a variable are minimized.
- *Promax Rotation.* An oblique rotation, which allows factors to be correlated. It can be calculated more quickly than a direct oblimin rotation, so it is useful for large datasets.

First impressions of the varimax output are that the factors are quite clearly delineated and therefore easy to read, if not interpret. Quartimax rotation does indeed minimize the number of factors extracted from this set of items. Equamax rotation provides a set of overlapping factors that are fairly difficult to interpret, as many items load highly onto more than one factor. “Eyeballing” these factors we get the impression that the substantive “theme” of the factors is reasonably similar to those derived by the other factor rotation methods. Scrutinizing the results from each of these rotation methods does not identify any surprising differences among them. The orthogonal rotations are considerably easier to conceptualize and understand, so there is no compelling reason to interpret a rotation other than varimax, which is sufficient for our purposes. Therefore we

will continue our analysis of the 54-item data set through the use of principal components factor extraction analysis, with varimax rotation applied to the output.

**Scree Plot**

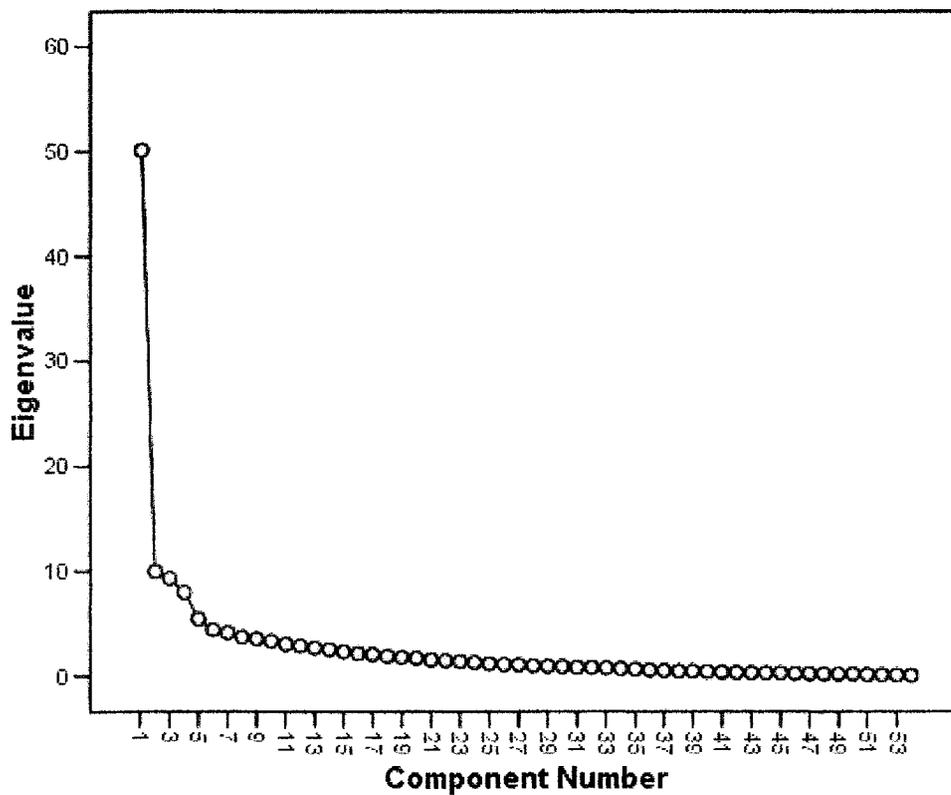


Figure 4: Scree plot of eigenvalues

The next challenge we face is to select the number of factors to which we ought to devote our attention. By using the “rule of thumb” that attention-worthy factors should have eigenvalues greater than one we see that a dozen factors fit this description; the majority of them with few or single significant loadings.

Conversely, selecting factors based on a Scree plot (see Figure 4) would indicate we should disregard all except the first factor. Neither of these strategies seems immediately desirable. Scanning the matrix of 54 items that load onto the 11 extracted factors (see Table 11, page 87), it is fairly obvious that the first four to six factors all are made up of many relatively high loadings. For example, if we take a loading value of 0.4 as a lower cut-off, then the first two factors at least are worth our attention, with five or more items loading on each factor and many of them loading quite a bit higher than the cut-off. Clearly the first two factors are of significant interest. Normally we would use a Maximum Likelihood extraction method to compare the difference between sequential factors (by comparing Chi-square statistics) and determine after which factor an “insignificant” amount of information is being added to the interpretation. Unfortunately, having such a large number of variables (54 items) gives us misleading results, implying that we need an unwieldy number of factors to explain the phenomena at hand. For the moment let us proceed using just our intuition and inspect primarily the first two factors extracted. Be aware that we should not necessarily ignore the remaining factors. It has been suggested by Morrison (1967) that,

“Frequently it is better to summarize the complex in terms of the first components with large and markedly distinct variances and include as highly specific and unique variances those responses which are generally independent in the system. Such unique responses could probably be represented by high loadings in the later components but only in the presence of considerable noise from the other unrelated variates.” (p. 228)

Our situation, with a large number of variables and only two fairly complex factors of interest is a good candidate for a strategy like this. By using a strategy like this, “more of the total information in the complex is retained, although some parsimony is sacrificed” (Stevens, 2002). Even if we were to take 0.5 as a lower limit when analysing extracted factors and thus “setting the bar higher,” the situation remains largely unchanged. We will find the first two factors made of 27 and five variables respectively, and the remaining nine factors are loaded with one to three items of fairly high weight.

	Rotated Component Matrix(a)										
	Component										
	1	2	3	4	5	6	7	8	9	10	11
BEING CAREFUL	0.218	-0.039	0.205	0.111	0.168	0.203	0.010	0.080	-0.065	0.017	0.003
TAKING INITIATIVE	0.795	0.320	0.243	0.092	-0.026	0.055	0.102	-0.099	-0.008	-0.077	0.072
RESPECT FOR INDIVIDUAL'S RIGHT	0.779	0.015	0.110	0.110	0.063	-0.178	0.157	0.023	-0.027	0.156	0.236
WORKING IN COLLABORATION W/ OTHERS	0.775	-0.029	0.065	0.039	0.043	-0.172	0.038	0.198	0.124	0.141	0.144
TAKING INDIV. RESPONSIBILITY	0.772	0.045	0.258	0.093	0.145	0.049	0.161	0.027	-0.008	-0.049	0.213
PAYING ATTENTION TO DETAIL	0.774	0.059	0.259	0.161	-0.061	0.280	-0.114	0.154	-0.015	0.046	-0.178
BEING HIGHLY ORGANIZED	0.752	-0.015	0.090	0.144	-0.035	0.151	-0.013	0.249	0.030	0.130	-0.145
FAIRNESS	0.721	-0.037	0.131	0.206	0.228	-0.052	0.054	-0.086	0.071	0.021	0.192
ACTION ORIENTATION	0.659	0.032	0.297	0.039	0.046	0.154	0.137	-0.045	0.049	0.095	0.275
EMPHASIS ON QUALITY	0.707	0.120	0.285	0.044	0.099	0.189	0.071	-0.003	0.106	-0.018	0.035
BEING TEAM ORIENTED	0.707	0.040	0.097	0.020	-0.114	-0.038	0.170	0.084	0.364	0.131	0.037
FLEXIBILITY	0.708	0.284	-0.104	0.265	0.050	-0.031	0.006	-0.131	0.081	0.021	0.143
BEING SUPPORTIVE	0.707	0.130	-0.012	0.122	0.126	-0.180	-0.083	0.041	0.268	0.052	0.137
SHARING INFORMATION FREELY	0.707	0.180	0.073	-0.223	0.112	0.012	0.055	0.115	0.188	0.035	-0.130
HIGH EXPECTATIONS FOR PERFORMANCE	0.710	0.227	0.378	-0.022	0.019	0.193	0.035	0.077	-0.144	0.094	0.135
BEING CALM	0.703	0.162	-0.133	0.084	0.160	-0.123	0.225	0.193	-0.122	0.193	-0.040
BEING PRECISE	0.703	-0.068	0.263	0.052	0.190	0.167	-0.106	0.023	-0.139	0.297	-0.116
TOLERANCE	0.670	0.133	0.098	0.163	0.145	-0.020	0.078	0.017	0.194	-0.190	0.231
ADAPTABILITY	0.665	0.150	-0.029	0.403	0.063	0.064	0.199	0.123	-0.102	-0.131	0.034
BEING PEOPLE ORIENTED	0.662	0.039	-0.056	0.152	-0.110	-0.121	0.095	0.029	0.287	0.030	0.162
BEING RESULTS ORIENTED	0.647	0.113	0.506	-0.067	0.169	0.196	0.057	0.044	-0.042	0.007	-0.025
ENTHUSIASM FOR JOB	0.616	0.235	0.240	0.114	-0.122	0.007	-0.038	0.336	-0.050	0.166	-0.033
LOW LEVEL OF CONFLICT	0.616	0.384	-0.087	0.062	0.088	-0.058	0.224	0.070	0.215	0.070	0.020
BEING REFLECTIVE	0.605	0.307	0.302	0.124	0.015	0.084	0.306	-0.057	0.023	-0.020	-0.076
BEING INNOVATIVE	0.581	0.399	0.478	-0.057	-0.096	-0.027	0.069	0.055	-0.080	0.072	0.142
OPPORTUNITIES FOR PROFESSIONAL GROWTH	0.571	0.214	0.122	0.513	0.003	0.054	-0.017	0.039	0.035	0.198	0.143
DECISIVENESS	0.541	0.022	0.196	0.220	0.405	0.193	0.128	0.131	-0.255	0.066	-0.067
BEING EASY GOING	0.495	0.366	-0.087	-0.034	0.320	-0.199	0.074	0.097	0.276	-0.303	0.014
CONFRONTING CONFLICT DIRECTLY	0.494	0.069	0.041	0.383	-0.077	0.202	0.206	0.360	-0.102	-0.007	-0.054
HAVING GOOD REPUTATION	0.487	0.215	0.028	-0.069	0.357	-0.058	0.040	0.362	-0.011	0.310	0.144
RISK TAKING	0.178	0.746	0.124	-0.174	0.095	0.095	-0.063	0.229	0.017	-0.089	-0.013
WILLINGNESS TO EXPERIMENT	0.462	0.744	0.248	0.204	-0.048	0.048	-0.049	-0.120	0.008	-0.114	0.029
BEING QUICK TO TAKE ADVANTAGE OPPORTUNITY	0.220	0.396	0.353	0.162	-0.024	0.058	0.278	0.033	0.143	0.218	-0.037
NOT BEING CONSTRAINED BY MANY RULES	0.029	0.373	-0.087	0.313	0.387	-0.209	0.002	-0.030	0.097	-0.025	0.110
BEING COMPETITIVE	0.000	0.524	0.158	0.118	0.053	0.375	0.130	0.316	-0.078	0.110	0.244
BEING ANALYTICAL	0.256	0.163	0.784	0.089	0.195	0.078	0.051	-0.043	0.065	0.026	0.014
HAVING ACHIEVEMENT ORIENT	0.467	0.099	0.813	0.123	-0.101	-0.059	0.027	0.077	0.049	0.081	0.314
HAVING CLEAR GUIDING PHILOSOPHY	0.426	0.218	0.447	0.385	-0.024	-0.035	0.142	0.202	-0.004	-0.087	-0.007
WORKING LONG HOURS	0.245	0.045	0.367	-0.276	0.046	0.134	0.108	0.320	-0.039	-0.297	0.194
HIGH PAY FOR GOOD PERFORMANCE	0.191	0.059	0.053	0.877	0.283	0.044	0.235	0.159	0.141	-0.030	-0.054
PRaise FOR PERFORMANCE	0.401	0.048	0.281	0.461	0.217	-0.031	-0.133	-0.116	0.354	0.177	0.206
STABILITY	0.296	0.007	0.058	0.427	0.362	0.132	0.263	0.273	0.134	0.269	0.080
INFORMALITY	0.111	0.213	0.177	0.133	0.255	-0.085	0.086	0.064	0.104	0.038	-0.018
FITTING IN	0.027	-0.122	-0.108	0.080	0.468	0.307	0.246	0.089	0.167	0.189	0.412
SECURITY OF EMPLOYMENT	0.201	-0.268	-0.107	0.303	0.404	-0.018	0.348	0.092	0.197	0.344	0.182
BEING AGGRESSIVE	0.029	0.004	-0.167	0.097	-0.020	0.778	-0.058	0.039	0.004	-0.188	0.106
BEING DEMANDING	-0.088	0.220	0.319	-0.130	0.087	0.778	0.092	-0.023	0.056	0.095	0.008
BEING RULE ORIENTED	0.387	-0.206	0.202	0.095	-0.188	0.778	0.088	0.241	0.039	0.060	0.170
PREDICTABILITY	0.059	-0.058	0.087	0.157	0.141	0.028	0.777	0.134	0.224	0.088	0.028
AUTONOMY	0.338	0.319	0.103	0.029	0.074	0.036	0.774	-0.027	-0.232	-0.037	0.084
EMPHASIZE SINGLE CULTURE	0.093	0.127	0.004	0.145	0.136	0.062	0.077	0.133	0.066	-0.072	0.029
DEVELOPING FRIENDS AT WORK	0.147	0.084	0.041	0.127	0.161	0.088	0.101	0.042	0.300	0.163	-0.053
BEING SOCIALLY RESPONSIBLE	0.311	-0.007	0.062	0.021	0.149	-0.073	0.088	-0.076	0.205	0.713	0.077
BEING DISTINCTIVE	0.288	0.140	0.183	0.010	0.045	0.214	0.030	0.047	-0.087	0.046	0.738

Rotation Method: Varimax with Kaiser Normalization.  
a. Rotation converged in 56 iterations.

Table 11: Results of principal components factor extraction with varimax rotation—this table reproduced larger in Appendix C

So just what do these factors represent? Taking a closer look at the extracted factors (and taking for now 0.5 as a cut-off for a 'significant' loading), we can see that the responses to our 54-item scale cluster together into factors as follows (see Table 11, page 87).

The first factor is a complex one with some thirty constituent items. It is therefore hard to capture in a few words the significant theme of this factor. Close scrutiny reveals at least two major themes recurring within this set of thirty items: an aspect of teamwork, and an emphasis on quality of work. For instance, *Working in Collaboration with Others; Being Team Oriented; Fairness; Being Supportive;* and *Low Level of Conflict* are some of the items that demonstrate the teamwork element while *Being Careful; Paying Attention to Detail; Emphasis on Quality;* and *Being Precise* are among the items that speak to values for quality. It is possible that factor one describes values that are engendered by the prototypical perfect employee—a team player, well socialized, and responsible. We prefer the phrase professional attitude toward quality teamwork here. Do not forget, however, the location and constituency from which these sample data were drawn. We are dealing with a hospital environment, and a specialized one at that. It should come as no surprise to see our respondents reporting high levels of importance on values such as teamwork and quality. As an interesting aside, there are certain similarities between the values captured here and the “Esteem” level

in Maslow's (1970) hierarchy of needs.<sup>1</sup> There are two types of esteem needs. First is self-esteem, which results from competence or mastery of a task. Second, there's the attention and recognition that comes from others. It is possible this factor describes a dimension of cultural values that correlates with a kind of social morality, and the esteem that flows from a mastery of task.

The second factor is interesting as all the values contained therein relate to a certain flexibility or adaptability. Risk taking, experimentation, opportunism, competition, and lack of rule constraint are actions that speak of active values for flexibility and perhaps innovation. Rather than interpret this cluster as a disdain for rules, or a disestablishmentarian component of culture, we prefer to suppose it describes values pertaining to creativity and responsiveness.

The third component has a moderate overlap with the first with respect to performance. The values here describe an achievement orientation, a value for analytical behaviour, and emphasis on results. Descriptors like hard work, fastidious, success orientation, or high-effort seem appropriate.

The remaining factors are not as complex, and we need to be cautious in interpreting them, since they represent rather faint 'signals' amid a fair degree of 'noise' in the system. However, a very high loading (approximately 0.8 or higher) is a sign that we should consider the possible meaning the factor. Of particular

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<sup>1</sup> While most sources, particularly in management literature, cite a hierarchy of five needs (Psychological, Safety, Belongingness and Love, Esteem, Self-Actualization) it should be noted that Maslow, in a 1970 revision to his original 1954 book expanded this hierarchy with two more levels above the original five. These are Desires to Know and Understand, and Aesthetic Needs. Thus by his 1954 accounting, Esteem needs are at the penultimate level, but by his 1970 description, Maslow places Esteem needs in the middle-most layer of his hierarchy.

interest are factors eight and nine. Each of these is characterized by a singular very high loading. One factor clearly speaks to a value for emphasizing a single culture. The other demonstrates a value for friendly social relations in the workplace. Each of these values proved to be highly valued by respondents in follow-up interviews that were conducted with various staff members of the target organization. A complete discussion follows later in this document.

One easy criticism of the preceding analysis is this: 54 items is quite a large set of variables for a principal components (or maximum likelihood) analysis, especially given the smallish number of observations upon which we are running calculations. Principal components analysis, like its mathematical cousin discriminant analysis, relies on a procedure of mathematical maximization. Because of this, there is the opportunity to unwittingly capitalize on chance—especially with a relatively small number of subjects compared to variables (as is the case with our data). Put another way, factor analysis tries mathematically to maximize the total variance in a system of equations. This is done under the probabilistic assumption that our data tend to be, *more often than not*, representative of the population. What if chance circumstances (or bad experimental design) have given us a sample that is less than representative? In such a case the maximization procedure would happily compound the error and generate misleading results in our factor analysis. Does this truism invalidate the use of the procedure? Not at all. But we should be aware of the limitations of our tools. Hav-

ing a small subject to variable ratio gives us more reason to look at other methods (such as qualitative techniques) to verify the apparent results.

Despite the limitations just discussed, the scale of 54 values items used in this questionnaire is presumed to be valid (based on the item selection process employed by O'Reilly et al. (1991)) and has a high reliability statistic as measured by Chronbach's alpha (see Table 12).

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.962	0.965	54

Table 12: Reliability statistics

Looking back to the study conducted by O'Reilly et al. (1991), there is little to compare between the clustering patterns of the 54 items in their study and ours. Recall that the O'Reilly study found eight factors, or components of organizational culture. These were, *Innovation; Attention to Detail; Outcome Orientation; Aggressiveness; Supportiveness; Emphasis on Rewards; Team Orientation;* and *Decisiveness*. By contrast, our study found a dozen factors, of which four were deemed to be of practical significance; two of these complex, and two simple. The first of these complex factors consists of items that loaded across seven of eight factors in the O'Reilly study, plus a further fourteen that did not load significantly on any items in that study. Likewise, our second factor is built of items that loaded on two of the O'Reilly factors, or didn't load significantly at all in that study. There could be a number of ways to explain these facts. The more important explanations, we feel, are that a larger data set would have provided greater

definition within the factor analysis routines, and might have allowed us to isolate factors that construed more precisely the dimensions of culture that we are attempting to describe. That is, where we have primarily two large factors consisting perhaps of several blended themes, we might have been able to discern with more precision and separate out conjoined themes into individual factors. Second, we must not overlook the important fact that the target organizations of the two studies are fundamentally different in nature. In the O'Reilly study, the sample population was a set of accounting organizations (and one "government agency"). The present study surveyed a highly specialized hospital environment. We suggest that accounting agencies and hospitals are fundamentally different institutions. Further, we suggest that the particular hospital unit involved in this study might be particularly focused and cohesive. Both of these facts could lead to differences in the findings between the present study and the O'Reilly study. For example, from both empirical and anecdotal evidence it is clear that staff in this hospital setting share a very strong common sense of purpose and are highly mission-focused.

#### **5.2.4 Qualitative Data—Interviews**

Of nine individuals who volunteered to be interviewed, hour-long interviews were successfully completed with seven of them. Considering the time demands placed on the staff of the host organization, this was a pleasing result. All the interviewees had quite a long duration of employment in the organization. This is not unusual for this organization. None of the subjects had been in their

profession less than thirteen years, with three of them more than twenty years into their careers. Six of the seven subjects had been with the Heart Institute for a dozen or more years, and two of them more than twenty years. The least length of employment with the organization was eight years. Only three of the subjects had spent the whole duration of their employment at the Heart Institute in a single role.

The other four subjects had occupied at least two roles within the organization. Duration of role occupation ranged from less than one year to more than twenty years. Roles represented in the set of seven respondents included technologists, administrators with different levels of seniority and responsibility, and a handful of nursing staff with very different responsibilities, who worked in different areas of the Heart Institute. We are satisfied that this sample gives us a variegated, if not scientifically representative, overview of the type of staff present in the organization. It should be able to read into their collective responses at least enough to corroborate or bring into question trends in the questionnaire data. Unfortunately, ethical concerns preclude publication of detailed accounts or quotations from such a small set of interviews. What follows is discussion that presents thematic information the researcher has extracted from interview data.

There were two facts that were immediately striking when we look at the data collected in these seven interviews. The first, and perhaps most important, is that all seven respondents confirmed—directly or indirectly—the overall single-mindedness of the organization. That is to say, there is a strong sense of mission,

a unity of purpose, and a priority focus on patient care. This focus transcends the boundary between “front-line” and “back-room” staff. It may or may not, however, extend to research personnel.<sup>2</sup> For our interview subjects, his state of mind overrides most of their grievances so that it comes as no surprise that our quantitative data show such minor variations between groups, small sample size notwithstanding. In the case of this particular organization, there does indeed exist a strong, single corporate culture.

There was obvious pride expressed by all of the interview subjects when discussing “corporate culture.” Each interviewee used similar language, and most referred to the long duration of employment that a typical Heart Institute staff member experiences. It seemed that respondents emphasized this fact to indicate a shared experience of satisfaction within the organization. Many of our seven subjects further indicated that the working environment in the Heart Institute is preferable to other hospitals that they, or people they knew, had experienced. This preference seemed more related to emotional climate and group pride than to the physical environment (which was often criticized). In terms of management culture or management style, Heart Institute founder Dr. William Keon was frequently singled out for his personal efforts to make the Heart Institute a place where staff members are proud and happy to work. In short, there is an overall culture of job satisfaction and pride at the Heart Institute.

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<sup>2</sup> It is unfortunate that the research arm of the organization was not represented in our questionnaire data; only one interview subject had firsthand experience on the research side of the organization. Therefore, we are not able to make informed statements about the state of mind of members of the research wing of the Institute.

Within the unified culture of this organization, however, our subjects' comments suggest the presence of distinct subcultures. It is important to remember that the following conclusions are based on only a very small sample of individuals. Nonetheless, There appear to be some distinct divisions in the organization in both vertical and horizontal directions. The former, a hierarchical schism, seems to separate 'front-line' staff from managers. This separation may be present at two levels, though we have no data to support this theory; it may exist once between patient care workers and their direct (i.e. Heart Institute) managers, and as a second vertical separation between Heart Institute management/administration and Ottawa Hospital management/administration. This latter relationship is a logical deduction indicated by a handful of oblique and direct references made by multiple interview subjects, but it falls outside the scope of the present research.

The former relationship—that of clinical care workers (primarily nurses) and their managers—is expressed in a repeated turn of phrase that was used by six of the seven subjects, and in nearly identical wording by each: "They don't know what I do here." In one of the six cases, the direction was reversed, with the subject indicating, "I don't have a clue as to what they do." Invariably, these comments popped up in the context of discussing change within the organization: either changes to physical facilities or to organizational procedures. Alongside this sentiment was expressed concern that managers are physically removed from the areas where patient care takes place. Some respondents seemed somewhat

envious of managers since many of the patient care areas are located in older parts of the building (such as the windowless basement areas) while many management offices are located higher up, and in a newer (and windowed) section of the building. Two of our subjects briefly alluded to a need for managers to spend more time in patient care areas so as to refresh their understanding of what takes place there. Two subjects indicated that better purchasing and planning decisions could be made if 'front-line' workers had input into planning processes. One comment specifically singled out an incident where new patient care areas were planned and constructed but the placement of fixtures and equipment within those areas was not well optimized for the procedures that were performed there. This was seen as an example where managers had made decisions or signed off on plans without the benefit of detailed knowledge of "what we do here." These sentiments indicate differences of outlook— "thought worlds" in the terms of Mary Douglas (1986)—that are indicative of possible subcultural boundaries. These are precisely the boundaries that need to be explored and understood if subcultural contexts are to be factored into managerial decisions.

As for Horizontal differentiation, our handful of interviews point to at least one area of friction that might indicate a cultural boundary. This is between technologists on the one hand and nurses and physicians on the other. It seems that nurses, over time, have had to relinquish certain responsibilities to more specialized technologists in operating rooms. Nurses that were interviewed implied that they have suffered a loss of respect as a result (though this was qualified by the

belief that they are generally well-respected by most everyone in the organization). On the other hand, we were told that technologists bristle when nurses, physicians or others mistakenly refer them to as technicians. Technicians have—in the eyes of technologists—less training and expertise and experience so referring to them with the wrong title is interpreted as flippant and disrespectful. Technologists paint a picture of nurses wherein nurses consider themselves very important to the functioning of the organization, playing a critical role. Contrasted with this, technologists complain that they receive a disproportionately small amount of respect for the importance of their work. Implied in our interviews was the sentiment that—while it's true that nurses are critical to the functioning of the organization—nurses are so numerous that the loss of a few would not have tremendous impact. Conversely, the small number of technologists in the organization requires the presence of every individual for continued operation at present levels of efficiency. Intensifying these feelings are several organizational and environmental issues. One of the most important of these being an organizational redesign that placed several categories of technologists under the supervision of nursing managers (despite the sentiment on the part of the technologists that nurse managers don't fully understand the job requirements and responsibilities of those technologists). Another environmental factor at play is the continual external pressure to trim expenditures (e.g. job positions) wherever possible. This creates a mutual fear by both nurses and technologists that manag-

ers and administrators who do not understand nor appreciate the functional roles of employees may make unsatisfactory staffing (hiring or firing) decisions.

Despite the apparent clarity of these findings, the reader is reminded that only seven interviews were conducted, so the generalizations presented here should be taken as indicative only—there are insufficient data for any scientific analysis of qualitative information here.

## **6 DISCUSSION**

How do the above analyses correspond with our theoretical framework? Recall that we defined culture as a socially created set of beliefs formed around values that are shared in common. Our questionnaire measured the importance of various values as reported by subjects for their work units, similar to the research of O'Reilly et al. (1991). In the data we found that nurses tended systematically to report different importance levels for certain values when compared to administrators, or when compared to all other employees. However, these differences were not dramatic.

### **6.1 High Degree of Unity**

At the outset of this project we fully expected to find pronounced differences between subcultures in the Heart Institute. As was stated earlier in this document, this organization was thought to be a “rich playground” for a study of subcultures because it is host to a wide variety of job roles, disciplines, training pathways, and socioeconomic groups. Any of these factors could become the basis for subculture variation (Triandis, 1972; Schein 1992; Schein 1996a). We were not expecting to see such strength and uniformity of a single corporate culture in the organization. In retrospect, it should be no surprise to find a high degree of unity of purpose in the Heart Institute. It is a specialized hospital that deals with many critical-care patients; it enjoys relative separation from its parent organiza-

tions the University of Ottawa and the Ottawa Hospital; it has a history of excellence in patient care; and it has been led for an extended period by a charismatic leader.

## **6.2 Mild Subcultural Distinctions**

If we consider why we did not find more conspicuous differences between subcultures within the organization we can speculate on some possible reasons. Here are four such possibilities. First and most obvious is the fact that the data set collected in this study was relatively small. This had a negative impact on statistical power and also limited the number of subgroups we were able to compare to just two—and one of those groups with few members. Another way to look at this situation is to see that entire categories of employees were not included in the analyses of data. Either no data were collected from a group (such as house-keeping staff or any staff in the research wing of the organization) or just one or two individuals of a given role-type responded to the questionnaire. Either way, the groups affected by this issue could not be represented properly in our analyses. This is truly unfortunate as it leaves unresolved the question of whether the instrument we used was sufficient for its intended purpose.

Of course, a second possible explanation for our having measured only small differences between subcultures at the Heart Institute is the possibility that any such differences really *are* quite minor. However, even our fairly basic quali-

tative investigation has given preliminary evidence that tends to lead us away from this conclusion.<sup>3</sup>

A third supposition would be that we have been looking for evidence in the wrong places. Perhaps the more pronounced subcultural differences lie among groups that we did not compare—either due to lack of data or by failure in research design. For instance, the preponderance of questionnaire respondents identified themselves as Canadian, and most of them Anglo-Canadian. Based on that knowledge, and knowing their roles within the Heart Institute, we assume that our sample mainly consists of people occupying the middle socioeconomic strata, plus a handful of wealthier physicians and surgeons. Could our results have been different had we data from the housekeeping staff, supply workers, and other “blue collar” workers who, presumably, would represent a working-class point-of-view for comparison? Perhaps we might have seen subcultures along class-structure lines (Ouchi & Johnson, 1978, in Trice & Beyer, 1993; Trice & Beyer, 1993). It is unfortunate that we received no data from the research arm of the Heart Institute. After all, the Heart Institute has a dual mission: patient care and research. With the recent arrival of a new CEO who promises to augment the Heart Institute’s status to a world-class research institution *and* maintain its international reputation for patient care, the “thought worlds” of researchers as compared and contrasted with patient care practitioners ought to be understood (Douglas, 1986; Dougherty, 1992). A few interview respondents (with patient

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<sup>3</sup> Qualitative evidence is not explicitly presented here due to restrictions imposed by the ethical certification processes of Carleton University, The University of Ottawa Heart Institute, or both.

care roles) remarked variously that they had no knowledge of people and activities in the research wing, nor that they had ever set foot in those spaces in the building. This could potentially be a large and important cultural boundary that needs to be bridged if the Heart Institute is to succeed in bringing these two functions closer together. If our research design really was looking in the wrong places, there are other analyses worth considering. As mentioned earlier, it was suggested by a few interview subjects that important differences in culture exist between the Heart Institute and the rest of the Ottawa Hospital system. Thus, our study might have equally been applied in analyzing the presumed differences between the various subdivisions of the larger Ottawa Hospital system (for example, the General, Civic, and Riverside campuses could be compared, along with the more specialized units: the Heart Institute, the Rehabilitation Centre, and the Ottawa Health Research Institute).

A fourth idea on the small number of differences detected between subgroups relates to our research instrument itself. One of our objectives was to determine whether the OCP, packaged in a questionnaire format, was sufficient to distinguish and profile organizational subcultures. For this we do not have a definitive answer. It appears that this instrument *does* have the ability to discriminate between subgroups at this level of analysis—we were, after all, able to show differences between nurses and others. But we need to exercise caution here because a small sample size forces a lowered confidence level in the conclusions based on our qualitative data. There is a small but real possibility that the in-

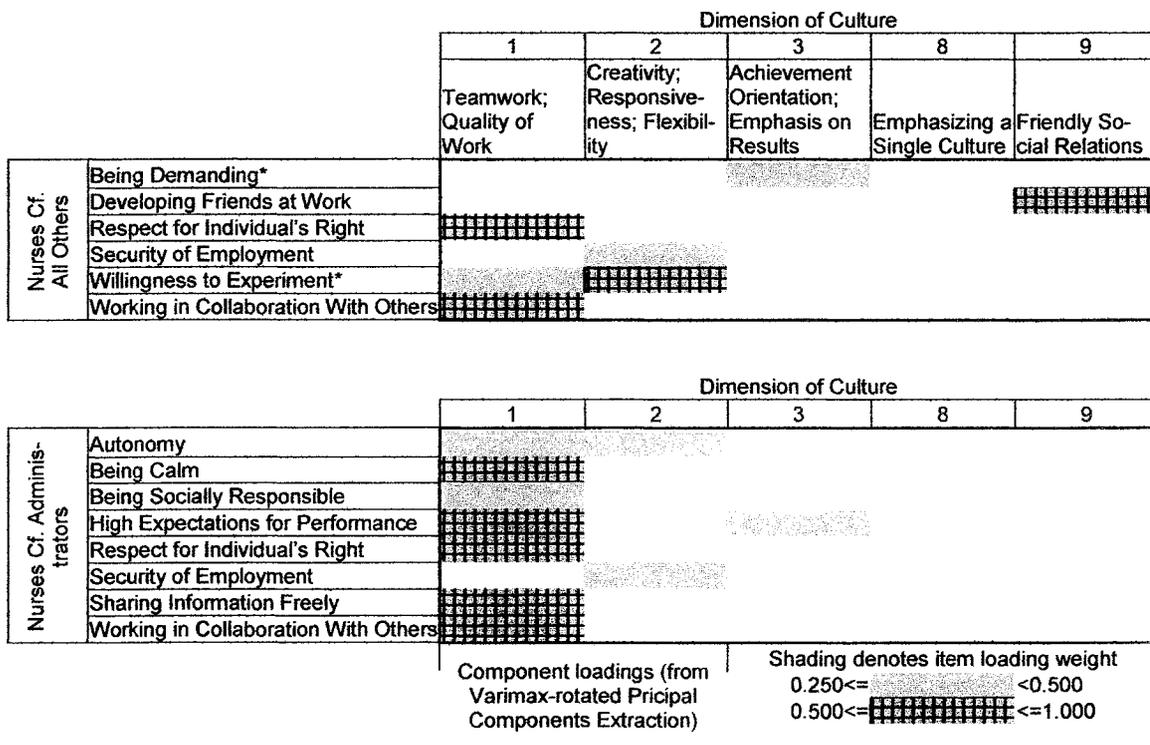
strument used here is not sensitive enough to detect the subcultural differences we want to see. Undoubtedly a much larger sample size would provide added discriminatory power, but is this the practical solution we have been seeking? Is it possible to use an instrument built around the OCP value set in a small- or medium-sized organization? Both Hofstede (1998) and O'Reilly et al. (1991) had sample sizes in the thousands in order to find distinctions like those we are talking about.

### **6.3 Going Beyond Values**

In addition to concerns about sample size, there is the possibility that the instrument was insufficient because it captures only one aspect of culture: work-related values. As was discussed in the preceding literature review, many authors define culture to be the sum of not only values, but also artefacts (behaviours and also tangible products). Schein (1992) has a nice discussion of such definitions. For the purposes of the project at hand, however, a limited definition of culture was used: We chose to focus only on work-related values, under the assumptions that these would be (1) sufficient to distinguish between groups and (2) easy to measure by quantitative means. Ultimately we have shown that values *can* be measured fairly easily in a questionnaire format, and that values *are* sufficient to distinguish between cultural subgroups. There remains doubt, however, that although we can identify and characterize subcultures by these means, we may not be able to *understand* the subcultures or its members. That is, a values profile can indicate key areas of difference between groups, but the significance of these dif-

ferences will be lost on us as outsiders (see Gregory, 1983). The nuances of sub-culture that guide the way in which members think and act are left unexplored. By disregarding aspects of culture other than values, not only might we be missing important identifying information that marks subcultural boundaries, but also it would be difficult to predict the reactions of a group to new organizational policies, for instance.

### 6.4 Comparing Nurses With Others



Note on directionality: Nurses consider these values MORE important in all cases EXCEPT for items denoted with \*.  
 Figure 5: Graphical representation of nurses' cultural differences cf. administrators, and all others, across five extracted factors

Having addressed some of the weaknesses of the research design, it would be wrong to overlook the fact that some very interesting results *did* turn up. The

questionnaire data was sufficient to distinguish differences of subculture, albeit mild ones. Looking at Figure 5 will help to visualize exactly where these differences lie, and give some insight as to what they might represent. By tabulating the five dimensions of culture that appeared significant (from principal components factor analysis in section 6.2.3) across the value statements that were correlated with differences in subculture (in section 6.2.1), we might hypothesize as to their meaning. Boxes in the table are shaded according to the 'weight' of each value's loading on the corresponding cultural dimension. The upper half of the table lists the six values for which nurses differed in their responses when compared with all other employees. The lower half shows eight values that were differently emphasized by nurses when compared to administrators. This table tells us that nurses report different levels of importance on specific values items than do administrators, and than do all non-nurse employees of the Heart Institute. What it does *not indicate*, is the direction of the difference (whether nurses reported higher or lower levels of importance as compared to other groups). In fact, we can see from comparing means on each item (not presented here) that nurses report *higher* levels of importance on all of the values shown in the table, with two exceptions that come from the comparison with all other employees: *Being Demanding*, and *Willingness to Experiment*. When describing the subculture of nurses, just a glance makes it obvious that the distinguishing characteristics are concentrated in dimensions one and two, with an important emphasis on dimension nine. These represent (1) an aspect of teamwork, and an emphasis on quality

of work; (2) values pertaining to creativity and responsiveness; (9) emphasis on friendly relationships at work. Contrast this with a comparison of nurses and administrators, where the differences in values emphasized are restricted mainly to the first dimension—teamwork and work quality.

These differences should probably make intuitive sense. By the nature of their job requirements, nurses' work requires excellence in quality—or their patients suffer direct and potentially grave consequences. Nurses work in a highly cooperative environment, so much so that the Heart Institute previously had them organized into formal and permanent teams (though now they are rotated through different shifts and duties and form temporary work groups). That nurses place higher levels of importance on teamwork as compared to other groups appears to follow existing theory—for instance, Schein (1996a) indicates that a group's core values become ingrained over time when ways of thinking and behaving become taken for granted, and that habitual behaviour then has a confirmatory effect on such values once they exist. In this example it is nurses' proclivity to work in teams that creates, then reinforces a value for teamwork. Although Heart Institute employees in general value teamwork and quality of work, the data here indicate that nurses value these items more. In a similar fashion, creativity and responsiveness are attributes that we can easily imagine attaching to a nurse's work with patients. And certainly we can understand that friendly relationships are an important part of a nurse's job but might not be as high a priority for staff that work behind the scenes. So it is not much of a stretch to imag-

ine that nurses' subculture differs from other subcultures along these same dimensions. Interesting that when looking at nurses compared with administrators the distinguishing characteristics are mostly concentrated in dimension one (teamwork; quality of work) and become slightly less pronounced in dimension two (creativity; responsiveness; flexibility). One wonders what Max Weber (1947) would have to say about the elements of bureaucratic culture in this institution where nurses and administrators are (in)distinguishable in these ways. Interestingly, Jones (1983) as cited by Hofstede (1998) identifies three forms of culture, one of them called "Bureaucratic" that could be interpreted as encompassing parts of the jobs of both nurses and administrators in the Heart Institute thereby explaining the partial similarities in their value priorities.

Also of interest in this discussion is the fact that nurses did *not* report differently the importance of the value that gave rise to dimension number eight in our findings: *Emphasizing a Single Culture*. In other words, this item was uniformly valued by all groups. Surprisingly, before we looked at the group means for the scale items we had expected that this item—emphasizing single culture—would be highly valued. After all, there appears to be a strong corporate culture at the Heart Institute. However this item has a relatively low mean (5.19 on a 9-point scale) and a fair bit of variance around that mean. This means that many respondents reported low importance and many others reported high importance on this item. No discernable pattern emerged as to particular groups of people rating this item higher or lower. How should we interpret these facts? There are a

number of possibilities. One is that although the OCP value set has good reliability, it could be lacking in validity (i.e. its “aim” is off, or it does not test the values it claims to). We find this a doubtful proposition—the OCP was put through rigorous testing by O’Reilly et al. (1991) during and after its use in their research, and was found by them to be both reliable and valid. Furthermore, while some questions were raised during pretesting of our questionnaire concerning ambiguity of some of the items in the scale, this one—*Emphasizing a Single Culture*—is one of the less ambiguous items in phrasing and interpretation. Instead, a better explanation is likely that even where respondents claimed low importance on this value, a uniformity of culture has developed at the Heart Institute over time. Once again, if true, this would lend support to the theories of cultural development and propagation as presented by Schein, Hofstede, and others discussed previously in the review of literature.

## **6.5 Length of Employment**

If cultural learning is time-dependent, then our data show that the Heart Institute is a good candidate for the development of a strong corporate culture. Figure 6 shows the number of survey respondents with various number of years’ tenure at the Heart Institute. Of immediate interest is the fact that more than 50% (n=70) of our sample has worked at the Heart Institute for ten years or more. Only ten of 130 respondents had less than one year of experience in the Heart Institute. The sample is, in fact, representative of the Heart Institute population in this regard. Looking at this one way, it can be argued that new members bring

into an organization new beliefs, ideas, practices, and the like, as has been argued by many authors in this field. These new cognitions and behaviours sow

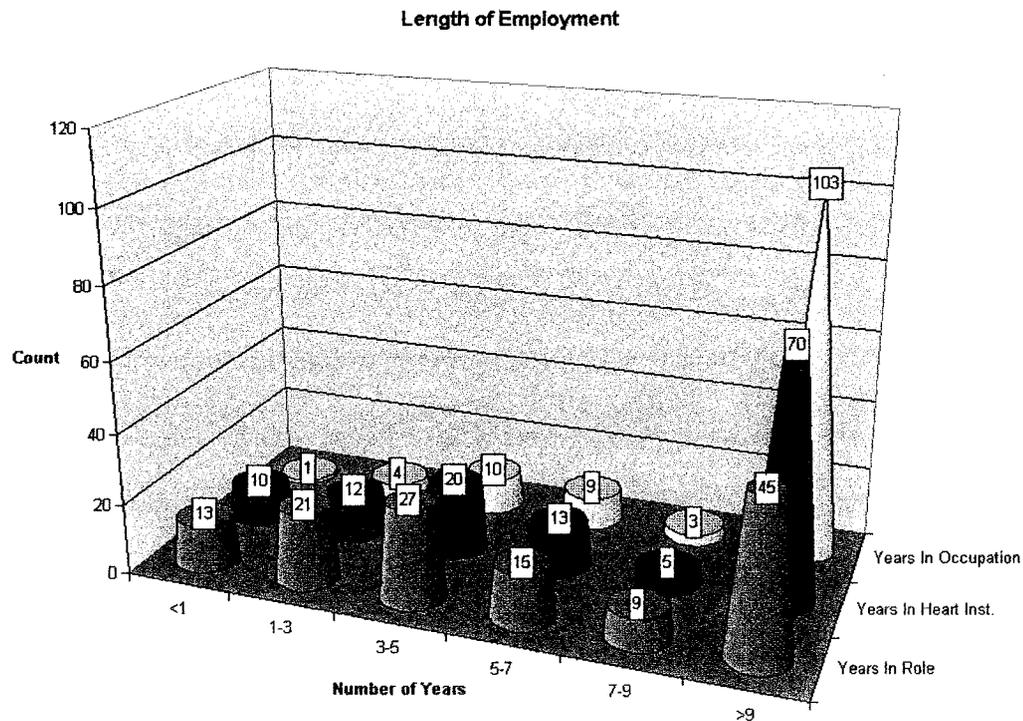


Figure 6: Questionnaire respondents' length of employment—in their current role, in the organization, and in their occupation

the seeds for cultural change. (See for example Ashforth & Mael, 1989; Hofstede, 1991; Barton, 2003). They also add to the variance in values that we would measure with an instrument like that utilized here. Part of the uniformity of values that our questionnaire detected—interpreted as strong organizational culture—may be due to the small number of new organization members sampled. The converse side of the same coin is predicted by Schein's (1992) model: over time, group members experience a degree of values convergence and cultural shift.

Whether this would generally happen at the level of organization culture, or of subculture, or both is not known. There are too many particular environmental factors involved to allow such a generalization. In the case of the Heart Institute, it appears that the generally long length of stay in the organization may be a contributing factor to a strong corporate culture. There is at least agreement among researchers that personal values, organizational commitment, and duration of employment are correlated (see for example Caldwell et al., 1990; O'Reilly et al., 1991; Chatman & Jehn, 1994).

## **6.6 Cultures and Subcultures Coexist**

The question can be asked: Can we claim the existence both of subcultures and a strong corporate culture in a single organization at the same time? It is common in management literature to deal only with the concept of a monolithic corporate culture. More recently there have been explorations into the subcultures present in work environments. Little attention has been paid to the convergence of these two frameworks. However there are the beginnings of theoretical argument for the presence of both corporate culture and subcultures simultaneously (for example, see Martin & Siehl, 1983; Lok & Crawford, 2001; Palthe & Kossek, 2003). Sackmann (1992) is one of a very few *empirical* studies that was equipped to find adjacent subcultures and corporate culture. Martin & Siehl (1983) developed a theory of three conditions where subcultures and supercultures coexist. The situation at the Heart Institute seems to conform to what they would call an “enhancing” condition. That is, subcultures at the Heart Institute

hold their own uniquely identifiable sets of values, but these values are positively aligned with the overall corporate culture. In this situation, there is an easy coexistence of corporate culture and subcultures, even to the point of strengthening the corporate culture. While our data set is small and therefore not fully conclusive, we at least can witness the presence of two distinct subcultures (nursing and administrative), show that these are different from each other, and further show that nursing culture is different from the culture of the rest of the organization. We deduce the existence of a strong corporate culture by virtue of the relatively small variances on most item means, and confirmatory indications from a handful of interview subjects.

## **6.7 Mental Models, Thought Worlds, and Cognitive Schema**

Returning to the theoretical framework sketched out in sections 2.4 and 4, we can now show that there are subcultural groups within the Heart Institute among which value priorities differ. It follows that these groups' "thought worlds" are similarly differentiated (Douglas, 1986; Dougherty, 1992). Since perceptions and mental models are determinants of behaviours (Schein, 1993), the decisions and actions of group members are dependent on the core values of that group to which they belong (Hofstede, 1991; Schein 1996a).

The managerial implications of this logical framework are important. Nurses and administrators *are* different kinds of people. Presumably physicians and pharmacists are different, just as would be orderlies and perfusionists. And their uniqueness means that members of each group would react differently when

faced with an organizational problem, procedural change, or the like. But since we can now begin to measure and understand each group's priorities, it is foreseeable that given the right tools, a manager can gain insight into the thought-worlds of organizational subgroups and understand how actions, reactions, and decisions are framed and enacted. Armed with the understanding that reality affects cognition, and cognition affects reality, a manager can be more sensitive when attempting to manage organizational change.

## **6.8 Future Research**

This project had known problems in several areas. Of primary concern is the fact that we are able to see only a faint reflection of the results we had hoped for. This means two things: (1) having such a small sample established a situation in which our results are not suited to generalizing. While we have described the population of the Heart Institute, we cannot generalize with any confidence to other organizations, even other hospitals. (2) The results do not show definitive evidence that this research design is particularly effective or efficient. A larger sample is required to compare subgroups effectively. For example, given three subject groups and fifteen dependent variables, we would require around 46 subjects per group to achieve a modest power = .70 at  $\alpha = .05$  with a large effect size ( $d=1$ ). This is a *very* optimistic scenario! Essentially this means the present research design is best suited to very large organizations where effective sampling generates data points numbering at least in the middle or high hundreds, if not thousands.

Hofstede's (1998) scale requires only 18 items, compared to the 54 of this study, and is worth further investigation. Furthermore, his scale explicitly measures work related practices, and not values. We would be interested to see whether his scale could be used to distinguish subcultures other than the three identified in his 1998 study. The three subcultures he identified were Professional, Administrative, and Customer Interfacing, and they are mapped onto six dimensions of culture. It would be interesting to see what findings his design would generate in an organization like the Heart Institute (Hofstede was studying a large insurance company).

In the course of conducting this research, it became evident that qualitative methods, such as observation and interview, are better for gaining a comprehensive view of culture, and doing it quickly, than are quantitative methods like our questionnaire. It is unfortunate that qualitative methods can be so difficult to implement—they really ought to be applied by a skilled practitioner—but the richness of information they can gather, and the potential for understanding nuances of culture would be quite difficult to match through quantitative means alone. Therefore we recognize that qualitative observations followed up with carefully targeted quantitative techniques are a strong combination.

Rather than focussing on values or artefacts, future students of culture and subculture may want to devise variants of Sackmann's (1992) model that investigates culture via different types of knowledge. It would be an interesting exercise to apply this measure of culture to the Heart Institute (again, a very different

kind of organization from that which Sackmann studied). We can only speculate as to what results it might have turned up. As theory progresses, perhaps knowledge types will become more accepted as integral to the definition of culture.

Notwithstanding the faint nature of results emerging from this study, the information extracted is tantalizing. It does appear that cultural differences can be detected within professional sub-groupings of single organizations. This indication may have value for management. Assuming that detection instruments can be improved and simplified, it might become possible to develop relevant 'profiles' of various sub-groups, which can help shape management strategies. That might have valuable impact on staff morale, inter-departmental coordination and ultimately improvements in efficiency, reductions in cost and increases in productivity.

## **7 APPENDIX A—ENGLISH QUESTIONNAIRE**



**INSTRUCTIONS:**

- You should only complete this questionnaire once; in French OR in English.  
*Vous ne devriez remplir ce sondage qu'une fois; en Français OU en Anglais.*
- Your **WORK GROUP** is made up of yourself, and the group of people with whom you work most closely every day. Generally, people would belong to only one work group.
- This questionnaire asks about the values that your work group seems to hold. Answer items 1 to 54 by indicating the importance of each item to your work group – not just to yourself.

**EXAMPLE:** ← less 7 more →  
*How much does your work group like ice cream? .....* 1 2 3 4 5 6 **7** 8 9

**How much does your work group value each of these behaviours and characteristics?**  
 (Remember – answer about your whole work group, not just yourself).

	← less valued								more valued →
1. Being socially responsible .....	1	2	3	4	5	6	7	8	9
2. Being distinctive – different from others.....	1	2	3	4	5	6	7	8	9
3. Fitting in.....	1	2	3	4	5	6	7	8	9
4. Being precise.....	1	2	3	4	5	6	7	8	9
5. Security of employment.....	1	2	3	4	5	6	7	8	9
6. Fairness .....	1	2	3	4	5	6	7	8	9
7. Offering praise for good performance .....	1	2	3	4	5	6	7	8	9
8. Being easy going .....	1	2	3	4	5	6	7	8	9
9. Being aggressive .....	1	2	3	4	5	6	7	8	9
10. Being supportive .....	1	2	3	4	5	6	7	8	9
11. Achievement orientation.....	1	2	3	4	5	6	7	8	9
12. Taking individual responsibility .....	1	2	3	4	5	6	7	8	9
13. Being careful.....	1	2	3	4	5	6	7	8	9
14. Having high expectations for performance.....	1	2	3	4	5	6	7	8	9
15. Being innovative .....	1	2	3	4	5	6	7	8	9
16. Being analytical.....	1	2	3	4	5	6	7	8	9
17. Being results oriented .....	1	2	3	4	5	6	7	8	9
18. Informality .....	1	2	3	4	5	6	7	8	9
19. Working long hours.....	1	2	3	4	5	6	7	8	9
20. An emphasis on quality .....	1	2	3	4	5	6	7	8	9
21. Being demanding.....	1	2	3	4	5	6	7	8	9
22. Decisiveness.....	1	2	3	4	5	6	7	8	9



	← less valued				more valued →				
23. Stability.....	1	2	3	4	5	6	7	8	9
24. Having a good reputation.....	1	2	3	4	5	6	7	8	9
25. Working in collaboration with others.....	1	2	3	4	5	6	7	8	9
26. Respect for the individual's right.....	1	2	3	4	5	6	7	8	9
27. Action orientation.....	1	2	3	4	5	6	7	8	9
28. Sharing information freely.....	1	2	3	4	5	6	7	8	9
29. Being calm.....	1	2	3	4	5	6	7	8	9
30. Enthusiasm for the job.....	1	2	3	4	5	6	7	8	9
31. Being highly organized.....	1	2	3	4	5	6	7	8	9
32. Confronting conflict directly.....	1	2	3	4	5	6	7	8	9
33. Being rule oriented.....	1	2	3	4	5	6	7	8	9
34. High pay for good performance.....	1	2	3	4	5	6	7	8	9
35. Adaptability.....	1	2	3	4	5	6	7	8	9
36. Opportunities for professional growth.....	1	2	3	4	5	6	7	8	9
37. A willingness to experiment.....	1	2	3	4	5	6	7	8	9
38. Paying attention to detail.....	1	2	3	4	5	6	7	8	9
39. Risk taking.....	1	2	3	4	5	6	7	8	9
40. Tolerance.....	1	2	3	4	5	6	7	8	9
41. Emphasizing a single culture throughout the organization.....	1	2	3	4	5	6	7	8	9
42. Not being constrained by many rules.....	1	2	3	4	5	6	7	8	9
43. Being competitive.....	1	2	3	4	5	6	7	8	9
44. Low level of conflict.....	1	2	3	4	5	6	7	8	9
45. Flexibility.....	1	2	3	4	5	6	7	8	9
46. Being people oriented.....	1	2	3	4	5	6	7	8	9
47. Developing friends at work.....	1	2	3	4	5	6	7	8	9
48. Being team oriented.....	1	2	3	4	5	6	7	8	9
49. Being reflective.....	1	2	3	4	5	6	7	8	9
50. Taking initiative.....	1	2	3	4	5	6	7	8	9
51. Having a clear guiding philosophy.....	1	2	3	4	5	6	7	8	9
52. Predictability.....	1	2	3	4	5	6	7	8	9
53. Autonomy.....	1	2	3	4	5	6	7	8	9
54. Being quick to take advantage of opportunities.....	1	2	3	4	5	6	7	8	9



The remaining questions ask about you, personally – not your work group.

55. Please describe your role at the Heart Institute: (check one)

Clerical and Support Staff

- Clinical Research Coordinator
- Communications staff
- Housekeeping staff
- Orderly staff
- Scholar (Graduate and postdoctoral levels)
- Scientific support staff
- Supply staff
- Transportation staff
- Ward Clerk
- Administrative support staff

Clinical Staff

- Pharmacist (not technician)
- Physician
- Registered Nurse
- Rehabilitation Therapist
- Research Scientist

Technologists and Technicians

- Anaesthesia Technology
- Cardiac Diagnostics
- Diagnostic Imagery
- Perfusion
- Pharmacy Technician
- Research Technician
- Respiratory Therapy
- Other role (please specify): \_\_\_\_\_

56. Within which physical area of the Heart Institute do you normally work? (check one)

- Administration
- ICU / CCU / Reference Centre
- Nursing Units
- Operating Room
- Outpatients
- Rehabilitation
- Research Centre
- My work requires me to be in several areas a lot of the time.
- Other area(s) (please specify): \_\_\_\_\_



Please indicate how much do you agree or disagree with each of the following three statements.  
(Your OCCUPATION signifies the work you do. Some examples are; Baker, Lawyer, Truck Driver, Artist, etc.)

← strongly disagree      strongly agree →

57. My occupation is important to me even when I'm not at work ..... 1 2 3 4 5 6 7 8 9
58. My occupation is part of "who I am." ..... 1 2 3 4 5 6 7 8 9
59. I think of myself as a member of my occupational group *first*, and a member of my organization *second*. (For example, I consider myself a Baker *first*, and an employee of Smith's Bakery *second*). ..... 1 2 3 4 5 6 7 8 9

60. How many years have you worked in your current role at the heart institute?

- Less than 1 year
- 1 – 3 years
- 3 – 5 years
- 5 – 7 years
- 7 – 9 years
- More than 9 years

61. How many years in total have you worked at the Heart Institute? (in any role)

- Less than 1 year
- 1 – 3 years
- 3 – 5 years
- 5 – 7 years
- 7 – 9 years
- More than 9 years

62. How many years in total have you worked in your profession or occupation? (at the Heart Institute and elsewhere)

- Less than 1 year
- 1 – 3 years
- 3 – 5 years
- 5 – 7 years
- 7 – 9 years
- More than 9 years



63. Where did you get most of your training for the work you do now? (check the one that best describes your training)

- Formal training (such as classroom instruction, coursework, apprenticeship or other formally organized instruction)
- Informal training (such as on-the-job training, learning through experience, or other unstructured learning opportunities)
- Other (please specify): \_\_\_\_\_

64. What is your employment status at the Heart Institute?

- Casual
- Full-Time
- Part-Time

65. What is your gender?

- Female
- Male

66. What is your age range?

- 25 years or under
- 26 – 33 years
- 34 – 41 years
- 42 – 49 years
- 50 – 57 years
- 58 – 65 years
- over 65 years

67. What level of education have you completed?

- Some High School
- Finished High School
- Some College / University
- Finished College / University
- Graduate-Level
- Post-Graduate



68. Of what cultural groups do you consider yourself to be a member?

*Some examples are; Canadian, French, English, Chinese, Italian, German, Scottish, Irish, Cree, Micmac, Métis, Inuit (Eskimo), East Indian, Ukrainian, Dutch, Polish, Portuguese, Filipino, Jewish, Greek, Jamaican, Vietnamese, Lebanese, Chilean, Somali, etc.*

(write as many answers as you think apply)

**Thank you for taking the time to  
complete this questionnaire.**

**Please return this to:  
Division of Anaesthesia  
H-2410 Heart Institute**

## 8 APPENDIX B—FRENCH QUESTIONNAIRE





	← moins apprécié    plus apprécié →								
23. Stabilité .....	1	2	3	4	5	6	7	8	9
24. Avoir bonne réputation .....	1	2	3	4	5	6	7	8	9
25. Travailler en collaboration.....	1	2	3	4	5	6	7	8	9
26. Respect du droit de la personne .....	1	2	3	4	5	6	7	8	9
27. Être axé sur l'action.....	1	2	3	4	5	6	7	8	9
28. Partager de l'information librement .....	1	2	3	4	5	6	7	8	9
29. Être calme .....	1	2	3	4	5	6	7	8	9
30. Enthousiasme à propos du travail.....	1	2	3	4	5	6	7	8	9
31. Être très organisé .....	1	2	3	4	5	6	7	8	9
32. Faire face aux conflits directement .....	1	2	3	4	5	6	7	8	9
33. Être axé sur le règlement .....	1	2	3	4	5	6	7	8	9
34. Salaire élevé pour un bon rendement .....	1	2	3	4	5	6	7	8	9
35. Faculté d'adaptation .....	1	2	3	4	5	6	7	8	9
36. Occasions de croissance professionnelle .....	1	2	3	4	5	6	7	8	9
37. Volonté d'expérimenter .....	1	2	3	4	5	6	7	8	9
38. Porter attention aux détails .....	1	2	3	4	5	6	7	8	9
39. Prendre des risques .....	1	2	3	4	5	6	7	8	9
40. Tolérance .....	1	2	3	4	5	6	7	8	9
41. Mettre l'emphase sur une seule culture dans toute l'organisation ..	1	2	3	4	5	6	7	8	9
42. Ne pas être entravé par de nombreux règlements .....	1	2	3	4	5	6	7	8	9
43. Avoir l'esprit de compétition.....	1	2	3	4	5	6	7	8	9
44. Faible niveau de conflit .....	1	2	3	4	5	6	7	8	9
45. Souplesse .....	1	2	3	4	5	6	7	8	9
46. Être axé sur les personnes.....	1	2	3	4	5	6	7	8	9
47. Se faire des amis au travail .....	1	2	3	4	5	6	7	8	9
48. Être axé sur l'équipe.....	1	2	3	4	5	6	7	8	9
49. Être réfléchi.....	1	2	3	4	5	6	7	8	9
50. Prendre des initiatives.....	1	2	3	4	5	6	7	8	9
51. Être guidé par une philosophie claire .....	1	2	3	4	5	6	7	8	9
52. Prévisibilité .....	1	2	3	4	5	6	7	8	9
53. Autonomie.....	1	2	3	4	5	6	7	8	9
54. Sauter sur les occasions .....	1	2	3	4	5	6	7	8	9



**Les questions qui restent portent sur vous personnellement – et non pas sur votre groupe de travail.**

55. Veuillez décrire votre fonction à l'Institut de cardiologie (En cocher une.)

Personnel de bureau et de soutien

- Coordinateur clinique de recherche
- Communications
- Entretien
- Préposé aux soins
- Études supérieures et postdoctorales
- Soutien scientifique
- Approvisionnement
- Transport
- Secrétaire-réceptionniste sur l'étage
- Soutien administratif

Personnel de clinique

- Pharmacien (non technicien)
- Médecin
- Infirmière autorisée
- Thérapeute en réadaptation
- Chercheur scientifique

Technologues et techniciens

- Technologie de l'anesthésie
- Diagnostics cardiaques
- Imagerie diagnostique
- Perfusion
- Technicien en pharmacie
- Technicien de recherche
- Inhalothérapeute

Autre fonction (veuillez préciser): \_\_\_\_\_

56. Dans quelle partie physique de l'Institut de cardiologie travaillez-vous habituellement ? (En cocher une.)

- Administration
- Soins intensifs / soins critiques / centre de renseignements
- Unités de soins
- Salle d'opération
- Clinique externe
- Réadaptation
- Centre de recherche
- Mon travail exige que je sois souvent dans plusieurs aires différentes.
- Autres aires (veuillez préciser): \_\_\_\_\_



Veillez indiquer à quel point vous êtes en accord ou en désaccord avec chacun des trois énoncés suivants. (Votre EMPLOI signifie le travail que vous faites. Voici quelques exemples : boulanger, avocat, camionneur, artiste, etc.)

- ← très en désaccord    très d'accord →
57. Mon emploi est important pour moi même si je ne suis pas  
au travail ..... 1 2 3 4 5 6 7 8 9
58. Mon emploi fait partie de « qui je suis » ..... 1 2 3 4 5 6 7 8 9
59. Je me vois comme faisant partie *en premier lieu* de mon  
groupe professionnel, et *en second lieu* de mon organisation.  
(Par exemple, je me considère comme étant un boulangier *en premier lieu*,  
et comme étant un employé de la Boulangerie Tremblay *en second lieu*)..... 1 2 3 4 5 6 7 8 9

60. Combien d'années avez-vous travaillé à votre poste actuel à l'Institut de cardiologie?

- Moins d'un an
- 1 – 3 ans
- 3 – 5 ans
- 5 – 7 ans
- 7 – 9 ans
- Plus de 9 ans

61. Combien d'années, au total, avez-vous travaillé à l'Institut de cardiologie ? (À n'importe quel poste.)

- Moins d'un an
- 1 – 3 ans
- 3 – 5 ans
- 5 – 7 ans
- 7 – 9 ans
- Plus de 9 ans

62. Combien d'années, au total, avez-vous travaillé dans votre profession ou emploi ? (À l'Institut de cardiologie et ailleurs.)

- Moins d'un an
- 1 – 3 ans
- 3 – 5 ans
- 5 – 7 ans
- 7 – 9 ans
- Plus de 9 ans



63. Où avez-vous acquis la plus grande partie de votre formation pour le travail que vous faites maintenant ? (Cochez le point qui décrit le mieux votre formation.)

- Formation structurée (telle qu'instruction en classe, travaux de cours, apprentissage ou autre éducation organisée systématiquement)
- Formation non structurée (telle que formation en cours d'emploi, apprentissage par l'expérience ou autres occasions d'apprentissage non structurées)
- Autre (veuillez préciser): \_\_\_\_\_

64. Quelle est le statut de votre emploi à l'Institut de cardiologie ?

- Occasionnel
- Temps plein
- Temps partiel

65. De quel sexe êtes-vous ?

- Féminin
- Masculin

66. Dans quel groupe d'âge êtes-vous ?

- 25 ans ou moins
- 26 – 33 ans
- 34 – 41 ans
- 42 – 49 ans
- 50 – 57 ans
- 58 – 65 ans
- plus de 65 ans

67. Quel niveau de scolarité avez-vous complété ?

- Quelques années d'école secondaire
- Diplôme d'études secondaires
- Quelques cours collégiaux ou universitaires
- Diplôme d'études collégiales ou universitaires
- Études universitaires de 2e cycle
- Postuniversitaire



68. De quel groupe culturel estimez-vous faire partie ?

*Voici quelques exemples : Canadien, Français, Anglais, Chinois, Italien, Allemand, Écossais, Irlandais, Cri, Micmac, Métis, Inuit (Eskimo), Indien, Ukrainien, Hollandais, Polonais, Portugais, Philippin, Juif, Grec, Jamaïcain, Vietnamien, Libanais, Chilien, Somalien, etc.*

(Inscrivez toutes les réponses qui s'appliquent, selon vous.)

**Merci d'avoir pris le temps de  
remplir ce questionnaire.**

**Veillez le retourner à la  
Section de l'anesthésie, pièce  
H-2410, Institut de cardiologie.**

**9 APPENDIX C—RESULTS FROM PRINCIPAL COMPONENTS EXTRACTION**

Rotated Component Matrix(a)

	1	2	3	4	5	6	7	8	9	10	11
BEING CAREFUL	0.816	-0.039	0.203	0.111	0.168	0.203	0.010	0.080	-0.065	0.017	0.003
TAKING INITIATIVE	0.785	0.320	0.243	0.082	-0.028	0.055	0.102	-0.098	-0.008	-0.077	0.072
RESPECT FOR INDIVIDUAL'S RIGHT	0.778	0.015	0.110	0.110	0.063	-0.176	0.157	0.023	-0.027	0.156	0.236
WORKING IN COLLABORATION W/ OTHERS	0.777	-0.029	0.065	0.039	0.043	-0.172	0.038	0.198	0.124	0.141	0.144
TAKING INDIV. RESPONSIBILITY	0.774	0.045	0.258	0.093	0.145	0.049	0.161	0.027	-0.008	-0.048	0.219
PAYING ATTENTION TO DETAIL	0.773	0.059	0.259	0.161	-0.061	0.280	-0.114	0.154	-0.015	0.046	0.176
BEING HIGHLY ORGANIZED	0.771	-0.015	0.090	0.144	-0.035	0.151	-0.013	0.248	0.030	0.130	-0.146
FAIRNESS	0.771	-0.037	0.131	0.206	0.228	-0.062	0.054	-0.098	0.071	0.021	0.192
ACTION ORIENTATION	0.769	0.032	0.297	0.039	0.046	0.154	0.137	-0.045	0.049	0.095	0.275
EMPHASIS ON QUALITY	0.761	0.120	0.295	0.044	0.089	0.169	0.071	-0.003	0.108	-0.018	0.035
BEING TEAM ORIENTED	0.748	0.040	0.097	0.020	-0.114	-0.036	0.170	0.084	0.364	0.131	0.037
FLEXIBILITY	0.745	0.284	0.264	0.265	0.050	-0.031	0.006	-0.131	0.081	0.021	0.143
BEING SUPPORTIVE	0.737	0.130	-0.012	0.122	0.126	-0.180	-0.083	0.041	0.266	0.052	0.137
SHARING INFORMATION FREELY	0.727	0.180	0.073	-0.223	0.112	0.012	0.063	0.115	0.168	0.035	-0.130
HIGH EXPECTATIONS FOR PERFORMANCE	0.716	0.227	0.378	-0.022	0.019	0.193	0.035	0.077	-0.144	0.094	0.135
BEING CALM	0.705	0.162	0.133	0.064	0.160	-0.123	0.225	0.193	-0.122	0.193	-0.040
BEING PRECISE	0.673	-0.068	0.263	0.052	0.190	0.187	-0.106	0.023	-0.139	0.297	-0.116
TOLERANCE	0.670	0.133	0.098	0.163	0.145	-0.020	0.078	0.017	0.194	-0.190	0.231
ADAPTABILITY	0.666	0.150	-0.025	0.403	0.063	0.064	0.189	0.123	-0.102	-0.131	0.034
BEING PEOPLE ORIENTED	0.662	0.039	-0.099	0.152	-0.110	-0.121	0.095	0.029	0.287	0.370	0.162
BEING RESULTS ORIENTED	0.647	0.113	0.406	-0.067	0.169	0.196	0.057	0.044	-0.042	0.007	-0.025
ENTHUSIASM FOR JOB	0.616	0.235	0.240	0.114	-0.122	0.007	-0.039	0.336	-0.050	0.106	-0.033
LOW LEVEL OF CONFLICT	0.616	0.364	-0.087	0.062	0.086	-0.058	0.070	0.224	0.215	0.070	0.020
BEING REFLECTIVE	0.608	0.307	0.302	0.124	0.015	0.084	0.368	-0.057	0.023	-0.026	-0.076
BEING INNOVATIVE	0.583	0.369	0.478	-0.057	-0.098	-0.027	0.068	0.055	-0.060	0.072	0.142
OPPORTUNITIES FOR PROFESSIONAL GROWTH	0.551	0.214	0.122	0.513	0.003	0.003	-0.017	0.039	0.035	0.196	0.143
DECISIVENESS	0.541	0.220	0.186	0.220	0.405	0.193	0.126	0.131	-0.255	0.066	-0.057
BEING EASY GOING	0.495	0.366	-0.087	-0.034	0.320	-0.199	0.074	0.097	0.278	-0.303	0.014
CONFRONTING CONFLICT DIRECTLY	0.484	0.089	0.041	0.389	-0.077	0.202	0.208	0.380	-0.102	-0.307	-0.054
HAVING GOOD REPUTATION	0.467	0.215	0.028	-0.069	0.357	-0.056	0.440	0.382	-0.011	0.310	0.144
RISK TAKING	0.426	0.748	0.124	-0.174	0.095	0.095	-0.063	0.229	0.017	-0.089	-0.013
WILLINGNESS TO EXPERIMENT	0.426	0.643	0.246	0.204	-0.046	0.048	-0.048	0.048	0.008	-0.114	0.029
BEING QUICK TO TAKE ADVANTAGE OPPORTUNITY	0.220	0.595	0.353	0.182	-0.024	0.059	0.278	0.033	0.143	0.218	-0.037
NOT BEING CONSTRAINED BY MANY RULES	0.029	0.575	-0.087	0.313	0.387	-0.209	0.002	-0.030	0.097	-0.025	0.110
BEING COMPETITIVE	0.000	0.524	0.158	0.118	0.053	0.375	0.130	0.316	-0.079	0.110	0.244
BEING ANALYTICAL	0.256	0.163	0.784	0.089	0.195	0.078	0.051	-0.043	0.065	0.026	0.014
HAVING ACHIEVEMENT ORIENT.	0.467	0.099	0.813	0.123	-0.101	-0.059	0.027	0.077	0.049	0.081	0.314
HAVING CLEAR GUIDING PHILOSOPHY	0.426	0.218	0.447	0.385	-0.024	-0.035	0.142	0.202	-0.004	-0.087	-0.007
WORKING LONG HOURS	0.245	0.045	0.387	-0.276	0.046	0.134	0.108	0.320	-0.039	-0.297	0.194
HIGH PAY FOR GOOD PERFORMANCE	0.191	0.059	0.053	0.677	0.283	0.044	0.235	0.156	0.141	-0.300	-0.054
PRaise FOR PERFORMANCE	0.407	0.048	0.261	0.461	0.217	-0.031	-0.135	-0.118	0.354	0.177	0.206
STABILITY	0.256	0.007	0.068	0.427	0.382	0.132	0.263	0.273	0.334	0.289	0.080
INFORMALITY	0.111	0.113	0.133	0.177	0.768	-0.085	0.080	0.084	0.104	0.038	-0.018
FITTING IN	0.027	-0.122	-0.106	0.080	0.469	0.307	0.246	0.089	0.167	0.189	0.412
SECURITY OF EMPLOYMENT	0.201	-0.266	-0.107	0.303	0.404	-0.019	-0.058	0.082	0.197	0.344	0.182
BEING AGGRESSIVE	0.029	0.004	-0.167	0.097	-0.020	0.708	0.004	0.020	0.004	-0.188	0.108
BEING DEMANDING	-0.066	0.220	0.315	-0.130	0.087	0.878	-0.023	-0.023	0.056	0.056	0.008
BEING RULE ORIENTED	0.367	-0.206	0.202	0.095	-0.166	0.953	0.241	0.039	0.039	0.080	0.026
PREDICTABILITY	0.055	-0.058	0.097	0.157	0.141	0.134	0.028	0.767	0.224	0.088	0.084
AUTONOMY	0.338	0.319	0.103	0.029	0.074	0.038	0.824	-0.027	-0.232	-0.037	0.084
EMPHASIZE SINGLE CULTURE	0.093	0.127	0.004	0.145	0.062	0.077	0.066	0.066	0.066	-0.072	0.029
DEVELOPING FRIENDS AT WORK	0.147	0.084	0.041	0.127	0.181	0.068	0.101	0.042	0.800	-0.072	0.053
BEING SOCIALLY RESPONSIBLE	0.311	-0.007	0.062	0.021	0.149	-0.073	0.088	-0.078	0.205	0.163	-0.053
BEING DISTINCTIVE	0.288	0.140	0.183	0.010	0.045	0.214	0.030	0.047	-0.057	0.048	0.738

a. Rotation converged in 56 iterations.

Table 13: Principal components extraction with varimax rotation. Same as table 11; reproduced larger for legibility.

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