1996

Cockpit-cabin communication : the impact of national and occupational cultures

Vicki R. Hoang
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COCKPIT-CABIN COMMUNICATION:
THE IMPACT OF NATIONAL AND OCCUPATIONAL CULTURES

A Thesis
Presented to
The Office of Graduate Studies and Research
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Vicki R. Hoang
December 1996

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ABSTRACT

COCKPIT-CABIN COMMUNICATION: THE IMPACT OF NATIONAL AND OCCUPATIONAL CULTURES

by Vicki R. Hoang

This study examined national and occupational differences among crew members from two monocultural international air carriers. A Flight Management Attitudes Questionnaire (FMAQ), developed and distributed by Helmreich, Merritt, Sherman, Gregorich, and Wiener (1993), was completed by 220 pilots and 246 flight attendants. Analyses of the FMAQ items were conducted to determine national and occupational differences as a function of four dimensions: power distance, uncertainty avoidance, individualism, and masculinity (Hofstede, 1984). Results indicated that there were significant national differences in attitude between the two air carriers on all four dimensions and significant occupational differences between pilots and flight attendants on the power distance and masculinity dimensions.

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**Cockpit-Cabin Communication:
The Impact of National and Occupational Cultures
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Footnote

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Abstract

This study examined national and occupational differences among crew members from two monocultural international air carriers. A Flight Management Attitudes Questionnaire (FMAQ), developed and distributed by Helmreich, Merritt, Sherman, Gregorich, and Wiener (1993), was completed by 220 pilots and 246 flight attendants. Analyses of the FMAQ items were conducted to determine national and occupational differences as a function of four dimensions: power distance, uncertainty avoidance, individualism, and masculinity (Hofstede, 1984). Results indicated that there were significant national differences in attitude between the two air carriers on all four dimensions and significant occupational differences between pilots and flight attendants on the power distance and masculinity dimensions.

Cockpit-Cabin Communication: The Impact of National and Occupational Cultures

With the rapid globalization of the air carrier industry, the steady proliferation of air traffic, and the reduction of the flight-deck crew from three persons to two, the flight crew workload is changing and becoming more demanding in terms of managing the aircraft (Radzi, 1995). Although aircraft technology has reached very high levels of performance and reliability, there is still concern for human error in the aircraft (Foushee & Helmreich, 1988). The trend in accident causes has shifted from technology to human-caused errors with the latter accounting for approximately 70% of all accidents (Yamamori, 1986; Helmreich & Foushee, 1993). Since the 1970s, aviation researchers have been exploring the human factor as a component separate from the human-machine interface system, and it has been realized that individual skilled behavior and group interaction play an integral role in flight safety. During this time, a concept was being developed which emphasized optimal flight-deck management and utilization of all available resources in the cockpit (i.e., technology, information, communication, leadership, teamwork, decision-making); this concept was later named “cockpit resource management” (CRM; Lauber, 1984).

Individual attitudes, behaviors, and group dynamics are important components of the CRM concept which influence both individual and group behaviors. A further broadening of this perspective should include external variables such as the organization, the environment, regulations, and culture; thus, CRM is a systems approach that encompasses integration of the individual, crew, organization, and infrastructure. This approach is exemplified in Helmreich and Foushee’s (1993) flight crew performance model which is a dynamic feedback loop system that involves the continuous interaction of input factors (individual attributes, crew composition, organizational factors), crew and mission performance functions (communications skills, decision processes, operating procedures), and outcome effects of these factors (safety, efficiency). The focus of the present study is on national and occupational differences pertinent to these CRM issues; specifically,

individual attitudes toward communication, leadership, decision-making, and teamwork styles will be studied.

When CRM was first developed and implemented, the focus was exclusively on the flight-deck crew. More recently, researchers have realized the necessity of examining the cabin crew's role in the overall aviation system and the implications for in-flight safety (thus, the term "cockpit" in CRM has been replaced with "crew"). As a result of such research, many air carriers today are implementing joint CRM training between the two crews with much success (Chute & Wiener, 1995; Helmreich, Wiener, & Kanki, 1993). Efficient and effective communication between crew members has always been an essential component of crew coordination and flight safety and is substantiated by numerous NTSB accident investigation reports (Kanki & Palmer, 1993). Several factors which influence the communication dynamics between cockpit and cabin crews are described in Chute and Wiener's (1995) five-factor model.

Chute and Wiener describe certain inherent, as well as socially-learned, characteristics that determine how effectively cabin and cockpit crews communicate. Their five-factor model delineates the major barriers which contribute to the division of the two crews as follows: historical, physical, organizational, regulatory, and psychosocial. These are briefly summarized below.

Chute & Wiener's Five-Factor Model

Historical Factors. Many of the cultural differences between the cockpit and cabin crews can be traced back to the early era of commercial aviation when aviation was a risky business and pilots were adventurous, daring, and self-reliant individuals. The first flight attendants were nurses, referred to then as "sky girls," whose primary objective was to comfort apprehensive or airsick passengers (Chute & Wiener, 1995). The sky girls treated pilots with the deference that was expected of them at that time. In fact, it was customary for sky girls to give pilots a military salute upon boarding and deplaning the aircraft.

Although the responsibilities, duties, and images of these two groups have changed dramatically since those early days, there are still residual effects of their history in today's air carrier crews (e.g., chain of command, departmental segregation).

Physical Factors. These barriers include the physical layout, functional design, and structure of the two work areas. Although not separated by a great amount of physical distance, the two areas are quite distinct from each other. The cockpit environment is confined and isolated, and the personnel are stationary while performing highly technical tasks. In contrast, the cabin environment is more spacious, and flight attendants are much more physically and socially active. This separation is further augmented by the physical and symbolic barrier of the cockpit door which divides the two crews.

Organizational Factors. The philosophy that an organization endorses can have a profound effect on the attitudes and performance of a crew. Because cockpit and cabin crews are typically assigned to different departments, they often have different philosophies, policies, and procedures. It is common in many airlines for cockpit crews to be assigned to the flight-operations department (which emphasizes safety) and the cabin crew to the marketing or sales department (which emphasizes service). This division often accounts for different knowledge sets being acquired in important areas such as emergency procedures, terminology and acronyms, and sterile cockpit because of the lack of standardization between the two groups in training, manuals, and procedures. This departmental division is further compounded by differences in organizational policies, salaries, benefits, and perceived status. These are all factors which may contribute to hostility between the two crews, lack of awareness of each other's duties, and the prevailing attitude that there are two distinct and separate crews.

Regulatory Factors. The sterile cockpit rule (FAR 121.542.b) for crew member duties states:

No flight crew member may engage in, nor may any pilot in command permit, any activity during a critical phase of flight which could distract any flight crew member from the performance of his or her duties or which could interfere in any way with the proper conduct of those duties. Activities such as eating meals, engaging in nonessential conversations within the cockpit and nonessential communications between the cabin and cockpit crew, and reading publications not related to the proper conduct of the flight are not required for the safe operation of the aircraft.

The initiation of the sterile cockpit rule has created ample confusion on the part of the flight attendant as to exactly *when* sterile cockpit goes into effect and *what* information is considered “essential communication.” The primary reason for this confusion is the vague definition of FAR 121.542.b and cabin crews’ limited knowledge of the duties and workload schedule of the flight deck.

Psychosocial Factors. There are innumerable individual variations between flight-deck and cabin crews based on personality dimensions, attitudes, gender, age, socioeconomic status, and cultural differences. It is a well-accepted social psychological theory that individuals tend to identify more closely with members of their own group and develop a psychological separateness from members of a different group (Allport, 1979, p. 18). Individual differences affect how crew members interact with each other and often result in biased interpretations of verbal and non-verbal communication which contribute to crew separation.

Cultural Issues

While Chute and Wiener have identified five factors which contribute to barriers between flight-deck and cabin crews, this study will focus on national and occupational cultures which are subsets of the psychosocial and organizational factors. For the purpose of this study, “national” and “occupational” cultures refer to the nation in which the participant was born or naturalized and to the flight-deck or cabin crew, respectively.

Why is culture important and how does it fit into the realm of crew interaction?

Because air carrier workforces are becoming more culturally heterogeneous, it is extremely common for international flight crews to consist of many foreign nationals who vary dramatically in experience, beliefs and values, religion, or language. In an environment comprised of, and influenced by, many different cultural groups, both verbal and non-verbal communication will determine how information is perceived, interpreted, and assessed in different ways by individuals with varying attitudes and beliefs. One of the primary concerns in a culturally diverse workforce is the lack of comprehension that often occurs because of these differences. One can imagine the potential for problems in an aviation environment by examining accidents or injuries that have occurred as a result of misunderstandings or miscommunication and which can be attributed directly to cultural differences in general (Morris, 1994).

Numerous studies have been conducted to understand and explain cultural differences. One of the most comprehensive studies on national culture was conducted by Hofstede (1984, 1991), in which data were collected from individuals from 50 countries worldwide. Hofstede defines culture as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (e.g., members of the same country possessing “one dominant national language, a common mass media, a national education system, a national army, a national political system”) (Hofstede, 1991, p. 12).

In a study on national characteristics, Inkeles and Levinson (1969) identified three basic issues which they described as common basic problems for individuals worldwide that influence both group and individual functioning. These three issues are (1) relation to authority, (2) conception of self; in particular, the relationship between individual and society, and (3) the individual’s concept of masculinity and femininity and ways of dealing with conflicts, including the control of aggression and the expression of feelings. In

response to his survey results concerning national values, Hofstede identified four distinct dimensions that are very closely related to Inkeles and Levinson's three issues.

Hofstede's Four Dimensions

The four dimensions which Hofstede uses to describe differences in national characteristics are *power distance*, *uncertainty avoidance*, *individualism*, and, *masculinity*, and are defined as follows (see Appendix A for a more detailed description): (1) *Power Distance* examines the relation to authority and is the degree to which individuals expect and accept inequality in a society, (2) *Uncertainty Avoidance* is the degree to which individuals are comfortable with novel, unpredictable situations which have an overall effect on how they deal with conflicts, (3) *Individualism* determines how individuals view themselves in the context of their society or community — priority or loyalty is either towards the self or is group-oriented; the opposite of individualism is collectivism, and (4) *Masculinity* refers to the degree that gender roles differ and is composed of work values associated with achievement, assertiveness, competition, and material success. This is in contrast to more feminine qualities which include caring and nurturing of others, quality of life, and compromise and negotiation.

By plotting scores from two dimensions on a graph, Hofstede (1984, p. 219) examined the interrelationship or combination of these dimensions that serve as predictors for various cultural attributes based on the quadrant in which the country's scores fall. Countries (scores) that are clustered more closely together will have more similar attributes, in terms of the dimensions plotted, than countries (scores) plotted further away. Each pair of dimensions can have various outcomes as indicated by the position on the dimensional matrix. For example, power distance and uncertainty avoidance scores can be plotted to determine attitudes toward power and how that power is governed or controlled within a country, resulting in four possible outcomes, or quadrant positions (i.e., high power, high

uncertainty; high power, low uncertainty; low power, high uncertainty; and low power, low uncertainty).

Effects of Cross-Cultural Training

In a comprehensive literature review of empirical studies on the effectiveness of cross-cultural training, Black and Mendenhall (1990) found that in many studies where cross-cultural training was used, there was significant improvement in performance. Enhancements were reported in skill dimensions of self, relationship, and perception that facilitated effective cross-cultural interaction. The review included various social science disciplines with participants who were managers, teachers, students, nurses, and public health personnel. In meta analyses of empirical studies on cross-cultural training of expatriate managers, Deshpande and Viswesvaran (1992) concluded that the true effects (rather than the measured effects) of cross-cultural training had a positive impact on the managers in the areas of self-development, perception, relationship, adjustment, and performance. Other studies have reported that for cross-cultural training programs to be successful, individual attitudes and communication skills (i.e., dealing with communication misunderstandings and different communication styles) were essential determinants of intercultural effectiveness (Hammer, Gudykunst, and Wiseman, 1978; Hannigan, 1990).

A distinction should be made at this point about the differences between improvements and solutions which may result from cultural training. Cross-cultural training, *at best*, can lead to improved performance and should not be viewed as a panacea for cultural problems that currently exist. Solutions are very difficult to identify, and the implementation of cross-cultural training can only attempt to minimize some of those problems. Although standardization of training and procedures will reduce some variability in individual behavior, there will always be aberrant situations in which procedures do not exist and decisions are based solely on judgment. It is widely accepted that judgmental heuristics and biases are influenced by many culturally derived factors (e.g., lifelong

experiences, knowledge, beliefs, and values) which can impact behaviors or attitudes toward attribution of responsibility and accountability, the willingness or reluctance to share information, and risk-taking or risk-aversion.

In their discussion of cultural theories of risk perception, Douglas and Wildavsky (1982) state that, “the type of society generates the type of accountability and focuses concern on particular dangers” and that “research into risk perception based on a cultural model would try to discover what different characteristics of social life elicit different responses to danger.” Wright, Phillips, Whalley, Choo, Ng, Tan, and Wisudha (1978) examined cultural differences between Asian and British student groups and found that there were cultural differences in probabilistic thinking in how the groups viewed uncertainty. Wright et al. concluded that for numerical or verbal probability assessments, British students were more likely than Asian students to view the world probabilistically (i.e., show a greater tendency to adopt a probabilistic set, have a more finely differentiated view of uncertainty, and more accurately determine meaningful numerical probabilities). The Asian students may have showed less probabilistic thinking because of the “fate-orientation” attitude that is predominant in many of the Asian cultures.

Hence, in the context of performing safety-related tasks (especially during high uncertainty, high-risk, and high-workload periods), crew members should strive to reduce ambiguity and misunderstandings which may further jeopardize safety. Because the consequences of a misunderstanding can be catastrophic on a commercial air carrier, the need for precise and timely communication is of the utmost importance.

An individual’s concept of time can affect the timeliness in which tasks are completed and schedules followed. For example, Americans view time as linear, compartmentalized, and tangible (i.e., being saved, spent, wasted, lost, made up) and are task-, schedule-, and procedures-oriented. This is in contrast to many European and South American countries, where individuals are more people-, relationship-, and family-oriented

(Hall, 1983). Needless to say, a decision on how quickly to take action (based on perceived urgency) can impact the outcome of the situation. Unnecessary time and energy used to resolve conflicts of perceived differences in uncertain or time-critical situations can be detrimental, as illustrated in the following section.

Cultural Factors in Aviation Incidents and Accidents

A human factors accident investigation team, in a supplemental report to the original accident report (His Majesty's Government of Nepal, 1993), concluded that the Thai Airways International Flight #311 accident was caused, in part, by inefficient communication and coordination between various parties of the air traffic system. Additionally, national and occupational factors contributed to the event, as depicted below.

Thai Airways International Flight #TG-311 — Kathmandu, Nepal

On July 31, 1992, Thai Airways International flight #311-A310 (TG-311) crashed into a 16,000' mountain peak near Kathmandu, Nepal, killing 99 passengers and 14 crew members. A Human Factors Working Group (HFWG) cited, "probable causes [of the accident], among other things, were the flight crew's management of the aircraft flight path, ineffective radio *communication* between the Area Control Center Controller and TG-311 pilots, and ineffective cockpit crew *coordination*." Additionally, nationality was a contributing factor in the ineffective communication and coordination between air traffic controllers and the flight-deck crew, controllers in the area control center and tower, the captain and the first officer, and the cabin and cockpit crews (Meyer, Fugl-Svendsen, Chewprechia, Suthichoti, & Jonasson, 1995).

The HFWG included in their report that the unique characteristics of the Thai and Nepali cultures may have influenced crew and air traffic controllers' behavior prior to the crash. They briefly described these characteristics as follows: (a) Nepalese nationals, in general, have a present orientation view of time, a fatalistic view of control, and a high need for structure and unambiguity (high uncertainty avoidance), (b) Thai nationals are

often individualistic and tend to avoid confrontations in order to save face, (c) Thai captains are also less likely to ask for feedback than international ex-patriot captains, and (d) both Thai and Nepali cultures have a strong sense of hierarchy and status (high power distance).

One example of how these national norms and values played a role in the accident can be seen in the behavior of the flight-deck crew. Crew interactions between the captain and co-pilot were very convoluted in terms of behavioral expectations concerning power and authority. The captain was younger, had less seniority, and (at least according to national norms) “appeared to show an appropriate amount of deference to his elder co-pilot.” Although this behavior would be considered appropriate for the norms and values of the captain’s national culture (deference towards the authority of elders), it is in conflict with the expected behavior of his occupational role, wherein the captain is indisputably first in command. Also, the captain displayed independent and individualistic traits and did not appear to rely on or trust either the co-pilot or controllers.

Another crucial area where cultural differences created misunderstandings was demonstrated in the communication between air traffic control (ATC) and the flight-deck crew. Because Nepalese controllers are perceived as having lower status than pilots and because both groups have a strong sense of hierarchy and status, it is contrary to Nepalese values to instruct, give orders, and “control” higher-status individuals. Because both groups have high power distance characteristics, it would be both expected and acceptable that the lower-status controllers would show greater deference to the higher-status pilots and not question or argue with them. Thus, the major communication problem between ATC and the flight-deck crew was that ATC was not adequately “controlling” but rather “advising” the TG-311 pilots.

It was also reported that the Nepalese ATC (again in accordance with their national norms and values) appeared to be unalarmed with the whole situation, and even after the accident, showed less-than-expected concern regarding accountability of actions. The

report further stated that because Nepalese nationals tend to have a high need for structure and a fatalistic attitude, it was quite probable that the Nepalese ATC were taking a passive role rather than altering the situation and were uncomfortable being in an ambiguous and uncertain predicament.

The HFWG also found an organization-wide cultural perception that Thai Airways emphasized status first, service second, and accident prevention strategy third. Since the organizational culture influences the perception that flight attendants are on board primarily for service rather than safety, the cabin crew are reactive rather than proactive on safety issues. The report stated that these issues “have an impact on the safe operation of an aircraft and were indeed significant in the events leading to the crash of TG-311.” Nationality, occupational factors, and organizational factors all impacted the behavior and communication between the cockpit and cabin crew, as suggested below:

None of the cabin crew of TG-311, being in a lower status than the cockpit crew, queried the cockpit crew as to why, after making their landing announcement or after switching on the seat belt signs normally turned on at around 20,000 feet during a descent phase, the aircraft did not land. It is quite clearly understood that, in many circumstances, the cabin crew dare not take a risk questioning the cockpit crew's action for fear that their questions might not be relevant to safety. On top of that, the national culture, in which hierarchy determines status does not support such action, especially from subordinates or persons of lower status....the cabin crew's value, due to national culture and as reinforced by organizational culture, would be to show their deference and obedience to the elders or persons of higher status, the unquestionable authority, the commander, in this case (Suthichoti, 1995).

Recommendations made by the HFWG included extending Flight Deck Resource Management to become Integrated Crew Resource Management, expanding the training to include ground, cabin, and upper management staff, and to clarify the role of the cabin crew concerning safety and service. Because much of the aforementioned behavior was reinforced and appropriate for the norms and values of each respective national culture, the HFWG recommended to the airline industry in general, “to consider the cultural differences between the parties when developing an Accident Prevention Strategy...along with providing resources on how to understand and work with those cultural differences.”

Turbulence Incident

The following account was extracted from a major international air carrier newsletter and is another example where nationality and occupational differences contributed to ineffective crew communication.

A 747-100 operating between Saipan and Tokyo experienced a brief severe turbulence encounter just after reaching its assigned cruise altitude of 35,000 feet (FL 350). As a result, 24 passengers and five flight attendants sustained varying degrees of injuries, none classified as major. It was later determined that a number of misunderstandings had developed relating to the manner in which the cabin and flight-deck crew handled their respective roles following the turbulence encounter. The following fundamental problems were identified as a result of the policies and procedures for staffing flights operating between Asian airports with an Asian cabin crew led by an American flight attendant: (a) intra-cabin communication, (b) cockpit-cabin communication, (c) language difficulties, and (d) passenger communication. All of these problems were to some extent a result of cultural differences among crew members.

1. *Intra-cabin communication.* Problems arose due to differing expectations concerning handling injured passengers and flight attendants. The Asian flight attendant was expecting some instructions from the American lead flight attendant, as he had been

trained. The American lead, meanwhile, was expecting the other flight attendant to immediately deal with the emergency as he had been taught.

2. *Cockpit-cabin communication.* Because the American lead flight attendant became engrossed with directing the cabin response, he was not available at the interphone when the second officer called to inquire about the cabin. An Asian flight attendant was the first to be contacted and, due to difficulties with the technical vocabulary, could not communicate effectively with the pilot.

During the debriefing, several of the Asian flight attendants said that their role as interpreters was very difficult because they must listen to the flight-deck crew or the lead flight attendant, often in the midst of a service or in a noisy part of the aircraft, try to get the gist of the message, and then make the announcement in their native tongue. Lengthy public announcements or those dealing with technical matters such as speed, altitude, or aircraft malfunctions can be nearly impossible to handle. Although not an issue in this incident, there are certain situations involving unanticipated problems where a lack of fluency could be critical (e.g., decompression or preparation for an emergency landing).

The flight attendants were anxious for some information from the flight crew. The captain wanted very much to provide information to the passengers and made several attempts to secure the interpreter's presence on the flight deck believing, as he did, that there was little point in an English language announcement to passengers who would not understand him. No one from the cabin team conveyed the message to him that any sort of announcement from the cockpit would help to assuage both passenger and flight attendant concerns over the turbulence encounter.

The captain also spoke several times with one Asian flight attendant whom he assumed was the interpreter. When he finally established that she was not, he asked her to bring the interpreter to the flight deck. After discussing the issue with the lead flight

attendant, it was discovered that the lead was distressed that he had not been initially contacted by the captain.

3. *Language difficulties.* With the exception of the lead flight attendant, English is normally the second language of the cabin crew who operate between Asian airports. Their degree of fluency varies widely but, in nearly all cases, they are unfamiliar with both slang and much of the technical jargon associated with flying. Therefore, conversation between Asian flight attendants and the lead or flight-deck crew is primed for misunderstandings.

4. *Passenger communication.* The flight was operated with only one Japanese-speaking flight attendant/interpreter. Unfortunately, she was one of the injured parties. This caused confusion and misunderstanding among the cockpit and cabin crews since all of the passengers were Japanese nationals. The interpreter was initially unable to make any announcements in her native language. However, she later went to a passenger seat and used a public announcement handset.

Although the examples illustrated above are not in themselves life-threatening situations, safety was clearly compromised. However, an incorrect interpretation of a gesture or comment can perpetuate negative feelings and attitudes, thus resulting in ineffective communication.

CRM and Cross-Cultural Research and Applications in Aviation

The examples above illustrate the safety implications of deficient communication as a result of national and occupational differences and clearly indicate the need for implementation of CRM cultural training programs for air carriers that have international and multicultural crews. Although there is an abundance of both organizational and management theories and cross-cultural research, there is limited literature available on national culture issues in aviation. Several studies have been conducted which examined the influence of national culture on the flight deck and the effectiveness of CRM, some of which are based on Hofstede's dimensions.

Merritt (1996) compared four monocultural air carriers (South American, English-speaking West European, Australian/New Zealand, and a regional carrier in the U.S.) and found significant differences in pilot attitudes concerning leadership and command issues. When pilots were asked about their preferred leadership styles, 70% of Anglo pilots favored a consultative style of leadership (work for a superior who usually consults with them before making a decision), compared to 40% of South American pilots (most South American pilots were inclined toward a more directive, authoritarian style of leadership).

Similar responses were seen in another item pertaining to crew members' attitude about challenging or questioning the captain's decision. Sixty-five percent of South American captains and an even higher percentage of co-pilots believed that crew members should not question the decisions or actions of the captain, except when they threaten the safety of the flight. Merritt also found that in abnormal or emergency situations, South American pilots would 'increase adherence to and reliance on the hierarchical command structure' as opposed to Anglo pilots who, in the same situation, would 'increase self-reliance and individual action.'

In a study conducted by Merritt and Helmreich (1993), pilots and flight attendants from the U.S. and eight Asian countries (Philippines, China, Hong Kong, Japan, Korea, Thailand, Singapore, and Taiwan) rated their attitudes toward command responsibility, communication, and coordination. The results indicated that there were attitudinal differences between the U.S. and Asian groups with the Asian groups (both pilots and flight attendants) reflecting high power distance and collectivism, the U.S. flight attendant group indicating moderate power distance and individualism, and the U.S. pilot group exhibiting low power distance and high individualism. Based on the characteristics of the power distance and individualism dimensions, one might expect that the leadership command for the Asian pilots and flight attendants would be strongly hierarchical with the captain as the unquestioned leader. Additionally, these crew members should also be

concerned with maintaining harmony and loyalty to the group. The U.S. flight attendant group would be less team-oriented, more assertive in speaking up, and more likely to work independently and keep personal problems separate from the workplace than the Asian flight attendant group. The U.S. pilot group would be highly egalitarian with minimal dependence on other crew members, should have the attitude that the captain does not have absolute authority, and should show less need for pre-flight briefings and verbalizing of plans.

Fortunately, CRM training has expanded to include the cabin crew and is now recognized by many major air carriers to be an important component of crew coordination and communication. Due to a massive expansion program in the late 1980s, Malaysia Airlines developed and implemented joint cockpit-cabin CRM training courses which addressed the issue of national differences. At one point, 38% (more than 400) of the Malaysia Airlines workforce were non-Malaysian nationalities, drawn from 17 countries. A “Culture Module” was developed to understand the various idiosyncrasies present in the company. This module was labeled the Malaysia Airlines Corporate Resource Orientation (MACRO) program (‘corporate’ to include other divisions in the program and MACRO for the big picture that extends beyond the cockpit realm). Personnel who attended this program include cabin crew, engineering personnel, and flight dispatch officers, with more than a thousand participants having completed the program. The objectives of MACRO are (a) to recognize how culture affects performance, (b) to recognize and appreciate similarities and differences in each other’s culture, and (c) to develop applicable skills and understanding for more effective management in a cross-cultural environment (Radzi, 1995).

Kabbani (1995, p. 100) described the importance of cultural training as, “the more airline personnel are able to understand the effects of culture, the more effective they will be in dealing with the human factors of their operating environment and the effects multi-

cultures have on those factors.” An example of how CRM training can be useful is the case of Saudi Arabian Airlines, the largest carrier in the Middle East. Saudi Arabian Airlines is a highly multicultural air carrier of 24,000 employees worldwide. Their non-Saudi national workforce is composed of 30% pilots from 39 countries and 70% cabin crew members from 50 countries. Their modified CRM concept, called Company Resource Management, considers any individual, department, or agency that interacts with the flight crew to be considered part of the “extended crew” (i.e., cabin, executive management, dispatch, maintenance, and ATC). The CRM training course emphasizes an interactive approach between members of the “extended crew” and facilitators encourage unique information to be shared with the group from the attendees’ cultural perspective, allowing “each attendee to understand how different cultures view the same situation differently.” The results of line observations found a more relaxed and professional relationship between flight-deck and cabin crews that attended CRM classes together.

The Present Study

This study examined national and occupational differences in crew member attitudes concerning issues of communication, leadership command, work values, conflict resolution, and organizational climate as a function of the power distance, individualism, masculinity, and uncertainty avoidance dimensions, as defined by Hofstede. The overriding question is whether individuals from a culture who select or are chosen for positions on flight-deck and cabin crews exhibit the same patterns on these dimensions as the members of the broader culture.

The data used in this study were archival from a joint aerospace research project among the National Aeronautics and Space Administration, the University of Texas, and the Federal Aviation Administration (NASA/UT/FAA) (Helmreich, Merritt, Sherman, Gregorich, & Wiener, 1993). The data were gathered through promotions with air carriers that had worked with this consortium, and through aviation conferences held in the U.S.,

Australia, South America, Great Britain, Europe, and Africa. Although the Helmreich et al. study included data collection from air carriers in fifteen countries, this thesis focused on data received from two air carriers from Australia and the Philippines. Many of the air carriers which participated surveyed only their pilots and not their flight attendants. This was often an issue of internal logistics; at many air carriers, the pilots work for the flight operations department, while the flight attendants work for the customer service and/or marketing department (interdepartmental cooperation is rare). The selection of the two air carriers used in this study was based on air carriers that were monocultural in nationality and had sufficient numbers of both flight attendant and pilot data to allow for systematic national and occupational comparisons to be performed. No significance should be attached to the choice of Australian and Filipino cultures. Rather, these cultures were used primarily as a model to illustrate how cultural measures can be applied to air carrier crews. In order to demonstrate the bases for the hypotheses stated below, a subset of Hofstede's (1984) index values for the two different cultures from which the sample was drawn is listed in Table 1. Based on these dimension scores, it was hypothesized that crew member responses for all four dimensions would correspond to Hofstede's index values (albeit Hofstede's sample population was employees from a large multinational corporation rather than the aviation industry).

Power Distance (PDI). Individuals from countries with high PDI scores both expect and desire inequalities among people, regardless of status. Lower status individuals depend on the more powerful and expect to be told what to do, with the ideal boss viewed as a benevolent autocrat or good father. Because Hofstede's scores for the Philippine population were very high in comparison to Australian scores, it was hypothesized that Filipino crew members in this study would have higher PDI scores than their Australian counterparts and exhibit high PDI characteristics, e.g., reliance on superiors for instructions, expectation of superiors to take initiative in decision-making, and reluctance to

Table 1. Hofstede's Index Values for Four Dimensions.

	PDI		UAI		IDV		MAS	
	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>
Philippines	96	4/50	44	44/50	32	31/50	64	11/50
Australia	36	41/50	51	37/50	90	2/50	61	16/50

Note. Rank refers to overall ranking out of 50 countries.

question higher status individuals. Conversely, Australian crew member responses should correspond to low PDI characteristics, e.g., equality between all crew members, subordinates expect to be consulted, and more democratic decision-making processes.

Uncertainty Avoidance (UAI). Hofstede's UAI scores for Australia were slightly higher than the Philippine scores, indicating stronger UAI characteristics for Australians. However, because the scores were so similar, it was hypothesized that Australian crew members would have comparable or imperceptibly higher scores than the Filipino crew members. High UAI countries are more comfortable with set rules and structured procedures, fear ambiguous situations and unfamiliar risk, view things that are different as dangerous, view time as money, have an emotional need to be busy and work hard, and are accustomed to precision and punctuality. Low UAI countries, on the other hand, tend to have more tolerance for new situations and problems, are comfortable in ambiguous situations, view things that are different as curious, believe that aggression and emotions should not be shown, and regard precision and punctuality as behaviors that must be learned.

Individualism (IDV). Hofstede's findings reflected higher IDV scores for Australia than the Philippines. Thus, it was hypothesized that Australian crew members would also have higher IDV scores than Filipino crew members and exhibit stronger IDV characteristics, e.g., speaking one's mind, favoring low-context communication, and maintaining the attitude that the task should prevail over the relationship. Individuals with high IDV characteristics have a greater willingness to speak up if something appears to be wrong; voice a different opinion from the group, even if the consequence is disruption of group harmony; and approach tasks as they see fit. This is in contrast to individual attitudes from more collectivist societies in which the emphasis is placed on harmony being maintained and direct confrontations avoided. Fundamental to the collectivist concept is that "the goal is for the good of the group rather than the individual."

Masculinity (MAS). Given Hofstede's results on the MAS dimension, it was hypothesized that MAS score differences between Filipino and Australian crew members would be minimal, with Filipinos having slightly higher scores than their Australian counterparts. Participant responses of both nationalities should indicate more masculine (rather than feminine) values. Masculine societies tend to be very performance-oriented, emphasizing ambition and competition, material success, achievement, and career progress, and hold less regard for social welfare and the emphasis on a caring and nurturing environment. The feminine society values equality, solidarity and quality of work life, and resolves conflict by compromise and negotiation, whereas masculine societies resolve conflicts by fighting them out.

Occupation. The two air carriers represented in this study were monocultural across crew occupations. It was therefore expected that since flight attendants and pilots were of the same nationality, their scores should be comparable. Because the flight attendant position is often perceived as lower status than the pilot position (e.g., position, income, benefits), flight attendants may be more reluctant to speak up and communicate problems, which would be indicated by slightly higher PDI and slightly lower IDV scores.

It was hypothesized that there would be minimal or no differences in the UAI dimension between flight attendants and pilots. Additionally, because the majority of flight attendants were females and pilots were males, it was expected that the greatest occupational difference would be in the MAS dimension, with pilots exhibiting higher MAS scores. Analyses of the four dimensions, however, may reveal that the effects of nationality have a greater influence on crew member attitudes and conceal any occupational effects.

Table 2. Demographic Information.

	Gender		Years in Organization	
	<u>% Female</u>	<u>% Male</u>	<u>Mean</u>	<u>SD</u>
Nationality:				
Filipino	34	66	10.45	8.83
Australian	26	74	12.16	8.02
Occupation:				
Flight Attendants	56	44	10.36	7.83
Pilots	1	99	12.36	9.05
Individual Group:				
Filipino Flight Attendants	63	37	9.66	8.45
Filipino Pilot	1	99	11.33	9.20
Australian Flight Attendants	48	52	11.07	7.12
Australian Pilot	2	98	13.39	8.80

Method

Participants

Voluntary participants in this study included pilots ($n = 220$) and flight attendants ($n = 246$) from two major international air carriers, with 110 pilots and 123 flight attendants from each air carrier (see Table 2 for demographic information). Since the original population for the Australian air carrier was not purely homogeneous in nationality, and unequal in sample size, 110 pilots and 123 flight attendants of Australian nationality were randomly extracted from the original sample group (354 pilots and 894 flight attendants; 94% Australian nationals) to equal the Filipino crew member group. The purpose of adjusting for equal sample sizes was to ensure that (1) ANOVA F-tests would withstand violations of the homogeneity of variance assumption and (2) have two purely monocultural groups. With the exception of one pilot from the Australian crew, whose nationality at birth was Indian, analyses in this study included only crew members who were born Filipino or Australian.

Procedures

In addition to participant recruiting, the NASA/UT/FAA Aerospace Research Project team conducted the questionnaire distribution and data collection. Data were collected from both flight attendants and pilots between April 1993 and February 1995.

Air carriers that indicated interest in the study were sent information pertaining to the purpose and the procedure of the study. A copy of the pilot and flight attendant questionnaire was attached and representatives from the air carrier were invited to make suggestions regarding additional items. The representatives were also asked to customize the demographic section of the questionnaire to match the job titles and positions in the company. The demographic section of the questionnaire asked for respondents' nationality and nationality at birth (if different) which was subsequently used to derive monocultural groups within each air carrier.

The decision as to whether the questionnaire needed to be translated was left to the participating air carrier. The Asian air carriers indicated that translation was not necessary (these operators conduct their training in English). The necessity for translation was minimized in the study because English is the international language of aviation, and most international air carriers require English in the cockpit.

Questionnaire and its Derivation

The 66-item Flight Management Attitudes Questionnaire (FMAQ) (Helmreich, Merritt, Sherman, Gregorich, & Wiener, 1993) was developed for the purpose of assessing and distinguishing cultural attitude differences between crew members. It was based on the Cockpit Management Attitude Questionnaire (CMAQ) (Helmreich, 1984), Hofstede's original items (those that were used to derive the indices for the four dimensions which, when applicable, were revised for the aviation environment), and new items added to complement and extend the existing items. The items extracted from the larger data set and used in the present study were selected based on Hofstede's four dimensions (see Appendix A).

The FMAQ consists of a 5-point Likert scale ("disagree strongly" to "agree strongly," "of very little or no importance" to "utmost importance," and "very frequently" to "very seldom") and contains items pertaining to the PDI, UAI, IDV, and MAS dimensions. Since items in the FMAQ were both positively (high values represent high-dimension attitudes) and negatively worded (low values represent high-dimension attitudes), all negatively worded items were reverse-scored so that high scores (i.e., 5), for both total and individual item scores, would represent high-dimension attitudes and low scores (i.e., 1) would represent low-dimension attitudes in all cases.

Comparisons were made on total mean scores for all items within each dimension. Since the IDV dimension consisted of 10 five-choice responses, 41 scores were possible, ranging from 10 to 50; the UAI dimension consisted of 9 five-choice responses, allowing

for 37 possible scores, ranging from 9 to 45; and the MAS dimension consisted of 8 five-choice responses, allowing for 33 possible scores, ranging from 8 to 40. The PDI dimension consisted of 9 five-choice responses but only seven of the items were included in the total scores, allowing for 29 possible scores, ranging from 7 to 35. The other two items refer to styles of leadership and were analyzed separately using cross-tabulations.

Results

Analyses of the FMAQ scores were conducted to determine if there were significant total mean score differences on the PDI, UAI, IDV, and MAS dimensions. Separate 2 x 2 between-subjects ANOVAs and descriptive analyses on individual items were utilized to analyze the effects of occupation (pilots vs. flight attendants) and nationality (Filipino vs. Australian) for each of the four dimensions. See Table 3 for total mean scores for the four dimensions. All data, as summarized below and pertaining to Likert responses, are based on composite percentages of similar responses (e.g., slightly agree and strongly agree).

Power Distance (PDI) Dimension

The 2 x 2 ANOVA revealed significant main effects on the PDI dimension for both nationality [$F(1, 465) = 53.31, p < .01, \eta^2 = .32$] and occupation [$F(1, 465) = 52.49, p < .01, \eta^2 = .32$], with Filipino crew members having higher scores than Australian crew members and flight attendants having higher scores than pilots. There was no significant Nationality x Occupation interaction [$F(1, 465) = 3.07, p > .05, \eta^2 = .08$].

As shown in Table 3, total mean scores for nationality, occupation, and individual groups were neither high nor low (between 20-22). The neutral scores across all groups were due to the large divergence between high and low scores on individual PDI items (averaging out to neutral). Examination of individual items revealed that, while there were significant differences between nationalities and between occupations, there also appeared to be strong similarities in response patterns for individual items between groups. Ranking of the seven individual PDI item mean scores (contributing to total scores) were identical

Table 3. Total Mean Scores for Four Dimensions.

	PDI (7-35)		UAI (9-45)		IDV (10-50)		MAS (8-40)	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Nationality:								
Filipino	21.21*	3.04	33.32*	3.59	38.44*	3.54	35.37*	3.23
Australian	20.39*	2.78	30.25*	3.28	35.47*	3.00	31.80*	3.34
Occupation:								
FAs	20.84*	3.30	31.78	3.65	36.82	3.71	34.12*	3.72
Pilots	20.76*	2.49	31.79	3.89	37.10	3.47	32.99*	3.67
Individual Group:								
Fil FA	20.99	3.43	32.92	3.58	38.23	3.69	36.07	2.96
Fil Pilot	21.45	2.54	33.77	3.56	38.68	3.35	34.60	3.36
Aus FA	20.68	3.17	30.64	3.36	35.41	3.18	32.17	3.38
Aus Pilot	20.07	2.24	29.81	3.14	35.53	2.81	31.38	3.26

Note. The numbers in parentheses listed under each dimension refer to the range of total scores. Fil = Filipino; Aus = Australian; FA = flight attendants.

*Significant differences, $P < .05$.

Figure 1. PDI Item Means for Nationality.

1 = *I expect to be consulted on matters that affect the performance of my duties.*

2 = *Crew members share responsibility for prioritizing activities in high workload situations.*

3 = *Senior staff deserve extra benefits and privileges.*

4 = *How frequently in your work environment are subordinates afraid to express disagreement with their superiors?*

5 = *In abnormal situations, I rely on my superiors to tell me what to do.*

6 = *Junior crew members should not question the captain's or senior crew members' decisions.*

7 = *Captains who encourage suggestions from crew members are weak leaders.*

for both nationality groups, and with the exception of one item, the same for occupational groups (see Figure 1).

Nationality Differences. Filipino crew members scored higher on the PDI dimension on five of the seven items, thus corresponding closely with Hofstede's findings and substantiating the hypothesis of this study. Responses indicated that there was a relatively large difference in attitudes on sharing responsibility for prioritizing activities in high workload situations. Eleven percent of Australian crew members thought that this was important, compared to only 2% of Filipino crew members. Crew members also differed on their views of senior staff deserving extra benefits and privileges, with 67% of Filipino and 57% of Australian crew members disagreeing with this idea.

Of the two items in which Australians indicated higher PDI characteristics, slightly more Australian crew members (25%) than Filipino crew members (23%) stated that they rely on their superiors to tell them what to do in abnormal situations. The other item was a question regarding how frequently subordinates are afraid to disagree with their superiors. Twenty percent of Filipino crew members and 22% of Australian crew members reported that this 'frequently' or 'very frequently' occurs. Although the Australian crew members scored higher on these two items, the percentage differences were extremely minimal.

Occupational Differences. As predicted, flight attendants had a slightly higher total mean PDI score than pilots. However, high and low individual item mean scores were evenly distributed between the two groups with flight attendants having higher PDI scores on three out of seven items (see Figure 2). In one item, crew members were asked, "How frequently are subordinates afraid to express disagreement with their superiors?" Thirty-four percent of pilots and a small percentage of flight attendants (9%) reported that this 'frequently' or 'very frequently' occurs (indicating higher PDI characteristics for pilots). This could probably be explained by the fact that within the cockpit, there is a strict chain of command or explicit hierarchy of positions — captains, first and second officers, and flight

Figure 2. PDI Item Means for Occupation.

1 = *I expect to be consulted on matters that affect the performance of my duties.*

2 = *Crew members share responsibility for prioritizing activities in high workload situations.*

3 = *Senior staff deserve extra benefits and privileges.*

4 = *How frequently in your work environment, are subordinates afraid to express disagreement with their superiors?*

5 = *In abnormal situations, I rely on my superiors to tell me what to do.*

6 = *Junior crew members should not question the captain's or senior crew members' decisions.*

7 = *Captains who encourage suggestions from crew members are weak leaders.*

engineers probably do not view themselves as equal in status. Irrespective of culture, most people find it more difficult to disagree or argue with a superior than with a person of equal status. Flight attendants on the other hand, with the exception of the lead person and seniority level, will probably view one another as being of equal status and position.

Although flight attendants had higher PDI scores on three items, analyses of two items found the percentage differences to be inconsequential (slightly more flight attendants believed that junior crew members should not question the captain's or senior crew members' decision and captains who encourage suggestions from crew members are weak leaders). The PDI item with the largest difference (in which flight attendants scored higher than pilots) revealed that 38% of flight attendants stated that they rely more on their superiors to tell them what to do in abnormal situations, compared to only 9% of the same response by pilots. These results correspond with responses to another question on preferred leadership style, as indicated below.

Crew members were asked two questions pertaining to their *preferred* and *actual* leadership styles (with four possible choices, later categorized as either 'autocratic,' 'mild autocratic,' 'consultative,' and 'majority rules'). Because these two questions used 4-point response options that were nominally categorized (rather than based on a continuum of varying degrees), the data were analyzed separately and not included in the total mean score. As shown in Table 4, flight attendants were the only group that preferred a 'mild autocratic' leadership style, supporting the idea that flight attendants are comfortable accepting instruction (also indicated by results from the previous question) and prefer not to make decisions. There was a substantial difference between Australian and Filipino flight attendant's preferences, however, with the majority of Australian flight attendants preferring 'mild autocratic' and the majority of Filipino flight attendants favoring 'majority rules.' The two pilot groups endorsed a 'consultative' style of leadership.

Table 4. Percentage of Preferred and Actual Leadership Styles.

	% Preferred / % Actual			
	Autocratic	Mild Autocratic	Consultative	Majority Rules
Nationality:				
Filipino	4/49	27/24	37/17	32/8
Australian	4/38	32/34	52/25	12/3
Occupation:				
FA	4/50	37/27	30/16	29/7
Pilot	4/38	21/33	61/26	14/3
Individual Group:				
Fil FA	2/48	26/23	28/18	44/11
Fil Pilot	7/53	27/27	46/16	20/4
Aus FA	6/51	47/31	32/14	15/4
Aus Pilot	3/23	14/38	75/37	8/2

Table 5. Cross-tabulation between Overall Preferred and Actual Leadership Styles.

<u>Preferred</u>	<u>Actual</u>				<u>Total</u>	<u>Percent</u>
	<u>Autocratic</u>	<u>Mild Auto</u>	<u>Consult</u>	<u>Majority</u>		
<u>Autocratic</u>	14	2	0	2	18	4
<u>Mild Auto</u>	59	53	10	8	130	29
<u>Consult</u>	82	54	64	3	203	45
<u>Majority</u>	44	24	22	11	101	22
<u>Total</u>	199	133	96	24	452	--
<u>Percent</u>	44	30	-- 21	5	--	100

In a related question, crew members were asked what style of leadership they most often found themselves working under (with the same four categories as for *preferred* leadership styles). Comparisons between both nationalities and occupations found that the majority of responses were 'autocratic.' Results on these two items clearly indicate the large disparity between crew members preferred (consultative) vs. actual or perceived (autocratic) leadership styles (see Table 5 for cross-tabulation). It is unknown whether these attitudes are specific to the participants in this study or are representative of work attitudes in general. It is likely, however, that these results are generalizable to many occupations and organizations.

Uncertainty Avoidance (UAI) Dimension

The 2 x 2 ANOVA revealed a significant Nationality x Occupation interaction for the UAI dimension [$F(1, 465) = 7.07, p < .01, \eta^2 = .12$]. Analyses of the group means revealed that for Filipino crew members, pilots had higher scores than flight attendants, and for Australian crew members, flight attendants scored higher than pilots. There was a significant nationality main effect, with Filipino crew members having higher scores than Australian crew members [$F(1, 465) = 96.76, p < .01, \eta^2 = .42$], but no significant occupational main effect [$F(1, 465) = .00, p > .05, \eta^2 = .00$].

As shown in Table 3, total mean scores for the UAI dimension for nationality, occupation, and individual group indicated moderately high UAI scores (between 30-34).

Nationality Differences. Although it was hypothesized that Australians would have comparable or slightly higher total mean scores on the UAI dimension, Filipino crew members scored higher on both total mean scores and on eight of the nine individual UAI items (see Figure 3). The only item that Australian crew members scored higher on was the statement, "during periods of low work activity, I would rather relax than keep busy with small tasks," in which 45% of Australian and 38% of Filipino crew members disagreed (higher UAI individuals prefer to keep busy).

Figure 3. UAI Item Means for Nationality.

1 = *I like my job.*

2 = *I work better when the operating procedures are flexible.*

3 = *Know everything about that job, to have no surprises?*

4 = *Have the time to consider more than one solution to a problem?*

5 = *Written procedures are necessary for all in-flight situations.*

6 = *How often do you feel nervous or tense at work?*

7 = *Have a changing work routine with new, unfamiliar tasks?*

8 = *The organization's rules should not be broken — even when the employee thinks it is in the organization's best interests.*

9 = *During periods of low work activity, I would rather relax than keep busy with small tasks.*

Crew members were asked how important it was for them to know everything about their job and not have any surprises. The results revealed that this was much more important for Filipino crew members, with a disproportionate 76% stating that it was 'very important or of the utmost importance' compared to the same response by only 37% of Australians.

Crew members were also queried on their attitudes concerning procedural issues. Seventy-three percent of Filipino crew members thought that written procedures were necessary for all in-flight situations, compared to only 44% of Australian crew members. This item was supported by another similar item in which 75% of Filipino crew members reported that they do *not* work better under flexible operating procedures, in contrast to 53% of Australians on the same response. These three items best illustrate the differences in attitudes on dealing with uncertainty and ambiguity. In this case, Filipino crew members appear to have a greater need for structure and clearly defined roles and responsibilities.

Occupational differences. As hypothesized, there were no significant differences (identical mean scores) between flight attendant and pilot responses on the UAI dimension. However, there was a significant occupation by nationality interaction which revealed that for Filipino crew members, pilots had *higher* UAI scores than flight attendants, in contrast to Australian crew members, wherein pilots had *lower* UAI scores than flight attendants.

Individualism (IDV) Dimension

The 2 X 2 ANOVA revealed a significant nationality main effect on the IDV dimension [$F(1, 465) = 213.25, p < .01, \eta^2 = .56$], with Filipino crew members having a higher total mean score than Australian crew members. There was no occupational main effect [$F(1, 465) = .75, p > .04, \eta^2 = .00$], nor significant Nationality x Occupation interaction [$F(1, 465) = 2.51, p > .05, \eta^2 = .07$].

Total mean scores for nationality, occupation, and individual group indicated

moderately high IDV scores (between 38–43), with Filipino crew members unexpectedly displaying the highest scores across individual groups (see Table 3). In fact, Filipino crew members scored higher than Australian crew members on eight of the ten individual items, as shown in Figure 4 (the two items that Australian crew members scored higher on had the least differences in scores).

There were relatively large differences in attitudes towards achievements of the group vs. the individual. Seventy-seven percent of Filipino crew members and 46% of Australian crew members reported that it was of ‘little or no importance’ to work in an environment where the group’s achievements are valued over individual success. When presented with the statement, “it makes no difference which organization I fly for,” 87% of Australian crew members either disagreed ‘strongly’ or ‘slightly’ with the item, compared to 70% of Filipino crew members. Filipino crew members also preferred considerable freedom to adopt their own approach to the job and to be able to openly discuss differences towards resolving conflicts.

The two items on which Australian crew members showed more individualistic tendencies were, “have sufficient time left for your personal or family life” and “if I perceive a problem with the flight, I will speak up, regardless of who might be affected.”

Occupational Differences. As hypothesized, pilots had higher scores than flight attendants on the IDV dimension; however, these differences were not significant.

Masculinity (MAS) Dimension

The 2 x 2 ANOVA revealed a significant nationality main effect [$F(1, 465) = 139.93, p < .01, \eta^2 = .48$], with Filipino crew members having higher scores than Australian crew members, as expected, and also a significant occupational main effect [$F(1, 465) = 14.05, p < .05, \eta^2 = .17$], with flight attendants having, unexpectedly, higher scores than pilots. No significant Nationality x Occupation interaction was found [$F(1, 465) = 1.26, p > .05, \eta^2 = .05$].

Figure 4. IDV Item Means for Nationality.

1 = *Work with people who cooperate well with one another?*

2 = *Have sufficient time left for your personal or family life?*

3 = *Live in area desirable to you and your family?*

4 = *To resolve conflicts, crew members should openly discuss their differences with each other.*

5 = *Have challenging tasks to do, from which you can get a personal sense of accomplishment?*

6 = *If I perceive a problem with the flight, I will speak up, regardless of who might be affected.*

7 = *Work in an environment where the group's achievements are valued over your individual success?*

8 = *Have considerable freedom to adopt your own approach to the job?*

9 = *It makes no difference to me which company I fly for.*

10 = *It is better to agree with other crew members than to voice a different opinion.*

As referenced in Table 3, total mean MAS scores were fairly high for nationality, occupation, and individual groups (between 31-36), with Filipino crew members having the highest scores. Overall, the ranking of the eight MAS items was very similar across nationality and occupation.

Nationality Differences. Examination of the individual items indicated that Filipino crew members had higher MAS scores on all eight items (see Figure 5). The individual item analyses revealed that Australian crew members placed substantially more importance on a warm relationship with their direct superior, with 77% of Filipino crew members indicating that this was unimportant, in contrast to 39% of Australian crew members. Also, a greater percentage of Filipino crew members (71%) reported that it was 'very important' or 'of the utmost importance' to have a job or career that brings them prestige and recognition from others, compared to only 40% of Australian crew members.

Occupational Differences. The MAS dimension revealed significant differences between pilot and flight attendant attitudes. Although it was hypothesized that pilots would have significantly higher MAS scores, flight attendant scores were actually higher (see Figure 6). The hypothesis that flight attendants would score lower on the MAS dimension was predicted on the expectation that the majority of flight attendants would be female and pilots would be male. However, there was an approximately equal gender distribution within the sample flight attendant group with a higher-than-expected percentage (44%) of males (99% of pilots were males, though). Although this higher percentage could effectually reduce MAS score differences, it does not explain the reversed direction of scores. It is plausible that organizational influences were responsible for these differences.

Upon examination of individual items, flight attendants had higher MAS scores on six out of eight items. The greatest difference between pilots and flight attendants was on attitudes concerning relationship and cooperation issues. Sixty-six percent of flight attendants, compared to 52% of pilots, believed that having a warm relationship with their

Figure 5. MAS Item Means for Nationality.

1 = *Have security of employment?*

2 = *Have an opportunity for advancement to higher-level jobs?*

3 = *Work with people who cooperate well with one another?*

4 = *Have an opportunity for high earnings?*

5 = *Maintain good interpersonal relationships with fellow workers or crew members?*

6 = *Have challenging tasks to do, from which you can get a personal sense of accomplishment?*

7 = *Have a warm relationship with your direct superior?*

8 = *Have a job or career that will bring you prestige and recognition from others?*

Figure 6. MAS Item Means for Occupation.

1 = *Have security of employment?*

2 = *Have an opportunity for advancement to higher-level jobs?*

3 = *Work with people who cooperate well with one another?*

4 = *Have an opportunity for high earnings?*

5 = *Maintain good interpersonal relationships with fellow workers or crew members?*

6 = *Have challenging tasks to do, from which you can get a personal sense of accomplishment?*

7 = *Have a warm relationship with your direct superior?*

8 = *Have a job or career that will bring you prestige and recognition from others?*

direct superior was unimportant. Likewise, pilots placed more importance than flight attendants on working with people who cooperate well with one another.

Although pilots had higher MAS scores on two items, the percentage differences on these items were minimal. Nonetheless, slightly more pilots reported that it was of high importance to have an opportunity for advancement to higher-level jobs and to have challenging tasks to do, from which they could get a personal sense of accomplishment.

Discussion

Comparisons of total mean scores revealed significant differences by nationality on all four dimensions and significant differences by occupation on the PDI and MAS dimensions. These results suggest that nationality may be a larger contributing factor than occupation concerning attitudinal differences in the areas of communication, leadership command, and other flight-management issues. While statistical analyses revealed differences between the comparison groups, the effect sizes should be considered in order to gain a practical and realistic understanding of the data. Partial eta-squared computations revealed the largest values for nationality with eta scores of .32, .42, .56, and .48 for the PDI, UAI, IDV, and MAS dimensions, respectively, compared to eta scores for occupation [.32 (PDI), .17 (MAS)] or Nationality x Occupation interaction effects [.12 (UAI)]. These values signify that more total variability is attributable to differences between nationality than occupation or the interaction between the two, and, that while these differences are shown to be statistically significant, they may be only moderately or marginally significant from a practical perspective. Nonetheless, the dimensional characteristics as identified by Hofstede may be reflected in a practical application to members of the aviation community.

One interesting finding of this study was the strong similarity between comparison groups in how crew members responded to items within each dimension. For example, although there were large fluctuations between low and high scores for individual PDI items, moderate fluctuations for IDV items, and slight fluctuations for the UAI and MAS

items, responses still appeared to be more similar than different. Perhaps this could be interpreted to mean that regardless of cultural differences, crew members are prioritizing the importance of specific tasks or functions in the same order, with the differences among items being a difference in the *degree* of importance.

Implications for International Flight Crews

The identification of cultural differences between crew members can lead to enhanced awareness, improved communication, positively impact crew performance, teamwork and rapport, satisfaction on the job, and in-flight safety. The following section addresses application of cross-cultural research to commercial air carriers and delineates examples or scenarios involving problems that could occur among crew members of this study, based on their scores and Hofstede's dimensional characteristics.

Although crew members may possess proficient communication skills during normal operations, under high stress and dynamic and unfamiliar conditions, crew members may not have the resources (e.g., time, cognitive/physical capabilities) to fully assess the situation and proceed with an appropriate action. It is during these times that there is a necessity for procedures that have been developed at an appropriate level of detail for the crew members who will be using them (individuals with a higher need for rules and regulations will probably have greater job satisfaction, and possibly work more effectively, with highly detailed procedures). As reflected in the UAI analyses, the Filipino crew members preferred written procedures for all in-flight situations and demonstrated a proclivity towards working in an environment with very few surprises, a familiar work routine, clearly defined operating procedures, and a strong adherence to rules and regulations.

If Australian and Filipino crew members from this study (or a separate crew with a similar multicultural makeup) collaborated as a single crew, several hypothetical scenarios could be postulated that represent the characteristics of these individuals. One such scenario

involves an emergency landing wherein a few unruly and violent individuals have harassed and injured several passengers and flight attendants (including the lead). In this scenario, the lead flight attendant is Australian and the remaining cabin crew are Australian and Filipino. Because of the absence of leadership from the lead flight attendant, the abnormal conditions, and the requirement for various duties to be performed efficiently (i.e., caring for injured passengers and preparing for an emergency landing), it is expected that Filipino crew members (with high UAI characteristics) would perform less effectively than Australian crew members (with low UAI characteristics) under these conditions. Moreover, it is believed that problems would occur between members of the Australian and Filipino groups concerning expectations of responsibilities and duties.

The findings of this study indicated that Filipino crew members had both higher PDI and IDV scores than Australian crew members. This is in opposition to Hofstede's results and somewhat contrary to high PDI countries who, in general, tend to be more collectivist. Nonetheless, both dimensions affect one's willingness to speak up, work independently, and interact with other crew members. Based on the IDV scores and Hofstede's dimensional characteristics, Filipino crew members should have a propensity to work independently, speak one's mind, and not be too concerned with maintaining harmony. Conversely, Australian crew members will be more disposed to enlist the support of other crew members and to value teamwork and group harmony.

Crew members with opposing PDI and IDV characteristics may develop erroneous perceptions of each other which may lead to crew dissension. For example, because Filipino crew members (who have low IDV characteristics) are more inclined to seek the advice and approval of other crew members and will probably expect others to have corresponding attitudes, they may be perceived by the Australian crew members (who have high IDV characteristics) as lacking initiative, unqualified, or ineffective in performing their

job functions. As a result of these perceptions, negative attitudes can ensue and create a separation between crew members.

Analyses of occupational differences revealed that flight attendants had higher PDI and lower IDV scores than pilots (in contrast to the nationality results but correlating to Hofstede's predictions that high PDI countries usually exhibit low IDV characteristics). Thus, based on the predicted characteristics of these scores, it is surmised that oftentimes flight attendants will expect to be told what to do and are reluctant to communicate with, or speak-up to pilots. A hypothetical, but frequently reported, scenario involves the flight-deck crew not relaying inflight turbulence information to the cabin crew or passengers because they are unaware of the more severe intensity that is experienced in the aft of the aircraft or they may have just forgotten to turn on the seat belt sign. Meanwhile, flight attendants in the cabin may be aware of the turbulence but reluctant to remind or persuade the flight-deck crew to turn on the sign. This hesitancy to communicate vital information to the cockpit could result in both passengers and flight attendants sustaining injuries because of an absence of a warning to be seated and fasten their seat belts.

Some reasons why flight attendants are disinclined to relay information to the flight-deck crew (as derived from the PDI dimensional characteristics) are as follows: flight attendant overreliance on the experience and judgment of the captain; assumption that the captain has all the necessary and correct facts; and flight attendant propensity to be agreeable and not question the higher-status captain (chain-of-command structure). It is expected that these behaviors would be even more prevalent for the Filipino flight attendants, who had higher PDI scores, than the Australian flight attendants. Furthermore, this behavioral attribute can be generalized to other types of incidents (e.g., technical or mechanical malfunctions). For example, Chute & Wiener (1995) found substantial disagreement between flight attendants and pilots concerning subject matter that warrants

interruption during sterile cockpit; flight attendants were relaying less information than pilots would have liked (during sterile cockpit and in their overall communication).

In summary, it is proposed that cross-cultural CRM training be implemented to alleviate some of the aforementioned cultural problems. Through careful examination of crew composition and social dynamics, operators can determine substantive topics to be incorporated into training, procedures, rules and regulations, briefings, and introductions, relevant to the dimensions presented in this study. For example, training, briefings, and introductions are important vehicles for transferring information and should always include detailed information on the appropriate chain of command and the responsibilities, duties, and expectations of each and every crew member; encouragement to speak-up; and protocols concerning sterile cockpit. Because establishing good rapport is especially important for multicultural crews with different attitudes, flight-deck training should emphasize to pilots that by engaging and interacting with their crews in either formal briefings or casual introductions, they can enhance teamwork, rapport, and management among crew members (Ginnett, 1987).

As indicated in this study, attitudes can vary significantly among individuals with different national or occupational backgrounds. Recognizing that individuals have different work preferences and leadership styles, perceptions of situations, and methods for resolving problems can be instrumental in the development of air carrier rules, regulations, procedures, and training of specific crews. Air carriers should examine the strengths and weaknesses of crew member characteristics and utilize this knowledge in the areas mentioned earlier (e.g., individuals with high IDV characteristics will be more task-oriented and may need training in teamwork skills, whereas the focus of training for low IDV individuals may be on assertiveness development). Moreover, administering the FMAQ or other attitude assessment scale to crew members can prove to be useful as an ongoing diagnostic tool for the evaluation and assessment of training programs.

Constraints and Limitations of Cultural Studies

Certain limitations exist when examining cross-cultural issues. Johnson (1993) states that “certain assumptions are made when examining CRM from a cross-cultural perspective; the assumptions and ideology underlying North American CRM training can themselves be viewed, and challenged, from the perspective of other cultures.” Hofstede (1991) supported this caution and stated that both organizations and *theories* about organizations are equally culture-bound. Upon examination of four classical contemporary authors of organizational theories from different parts of the world, he found that their philosophical models corresponded as expected to the attributes assigned to each of the countries, dependent on where they were positioned on the power distance and uncertainty avoidance dimensional matrix (each country was positioned on a different quadrant). The French engineer Henri Fayol's conception was that authority should be both in the person *and* in the rules (high power distance, high uncertainty avoidance); the German academic, Max Weber, believed that authority was in the rules and the power of the ‘officials’ is strictly delimited by these rules (low power distance, high uncertainty avoidance); the American engineer, Frederick Winslow Taylor, endorsed the concept that the authority is neither in the person nor in the rules, but in the situation (low power distance, low uncertainty avoidance); and finally, the Chinese scholar, Sun Yat-sen, stressed authority of the President, yet with control powers based on government of man (high power distance, low uncertainty avoidance).

Because the FMAQ was developed by researchers in the U.S. (and inextricably contains Western biases and perspectives), it is not clear that the words or concepts used have consistent meanings among individuals of Australian, Filipino, or American nationality. The FMAQ was not translated for the Filipino crew members, so it is questionable whether subtle nuances of the English language changed the meaning of the wording, concepts, or context (e.g., achievement, self-reliance).

Based on the assumption that cross-cultural literature and theories are culture-bound, developers of training programs should consider not only organizational or national culture concerns, but biases that may exist in themselves, organizational, and management theories. The development of culture-specific training programs should be viewed from a multidimensional perspective with regard to all cultural levels and include, at a minimum, consideration of the organization, individual differences (i.e., nationality, ethnicity, language), the effects of cultural biases in present training models and theories, and occupational differences. These culture-specific training programs should be considered during program development in order to meet the needs of particular organizations. Training programs which may be adequate in one country or organization may not be appropriate when applied elsewhere (Merritt, 1994; Radzi, 1995).

Because this study attempted only to identify national and occupational differences between monocultural air carriers, it cannot address specific problems that occur in nationally diverse single crews nor assume that differences that exist between two monocultural air carriers will also be present in culturally diverse crews. Therefore, generalizations should not be made to multicultural (national) crews. Furthermore, because comparisons were limited to only two national groups, it cannot be assumed that differences between nationalities were due strictly to national culture factors. Since the two air carriers were part of completely different organizations, it is unknown to what extent the two air carriers are similar in corporate philosophy, training, employee incentives, policies and procedures. Organizational culture can influence or modify employees' attitudes (or it may inherently attract a certain type of individual who already "fits" into the current work ethos), personnel selection, quality and quantity of training, management skills, procedures and policies, and employee perceptions of their role and importance — all of which can have a subsequent positive or negative impact on both team and individual performance. Thus, it is practicable that organizational or industrial influences may be part of the reason

for the disparity between the findings of this research (international commercial air carrier) and Hofstede's study (multinational corporation).

Conclusion

This research endeavored to identify any attitudinal differences that may exist between crew members in the areas of communication and coordination, leadership styles, comfort level in dealing with unexpected problems or issues, and work values at a national and occupational level. The findings from this study showed that attitudes concerning these and other flight-management issues for the four groups in question are influenced by nationality, and to a lesser extent, occupation. It is hoped that further cultural research will be conducted to determine how, and to what extent, cultural differences affect crew performance. Since research concerning national and occupational issues in aviation has only recently emerged and is still relatively limited, there is a wide arena for further research, including the identification of specific cultural differences (attitudes and behavior) at various levels, the determination of how these individual differences impact the crew, investigation of the context of the problem in the overall in-flight system, and developing solutions that are both adaptive and accommodating to a diverse workforce.

Human factors has been described as the application of the knowledge of human physical and cognitive capabilities and limitations and the adaptation of the system to the human, rather than the human to the system. In the case of the "human" as the individual crew member, and the interaction of crew members as the "system," we know that individuals will frequently resist accepting or adopting new core attitudes and beliefs — thus an error-tolerant approach should be applied to this social subsystem. While the objective of most training will be to create a more monocultural 'corporate' group, it must be accepted that conflicts and misunderstandings will arise due to cultural differences; attempts must then be made to understand the types of differences to be expected so that subsequent training can address these issues. CRM training strives to enhance teamwork

and performance among crew members with potentially differing attitudes based on individual differences (e.g., personality, status, and national culture) and should, thus, include education on understanding different cultures and how to more effectively interpret cross-cultural situations that can lead to conflict. Enhancement of crew interaction, performance, and flight safety can be reached through mitigation of ambiguity in both verbal and non-verbal communication. Hofstede described the problems of cultural differences best when he stated that, “countries have common problems, but with solutions differing from country to country.”

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Appendix A

Hofstede's Key Dimensional Differences for Power Distance (PDI)

Key differences between small and large power distance societies for general norm, family, school, and workplace.

<i>Small Power Distance</i>	<i>Large Power Distance</i>
Inequalities among people should be minimized	Inequalities among people are both expected and desired
There should be, and there is to some extent, interdependence between less and more powerful people	Less powerful people should be dependent on the more powerful; in practice, less powerful people are polarized between dependence and counterdependence
Parents treat children as equals	Parents teach children obedience
Children treat parents as equals	Children treat parents with respect
Teachers expect initiatives from students in class	Teachers are expected to take all initiatives in class
Teachers are experts who transfer impersonal truths	Teachers are gurus who transfer personal wisdom
Students treat teachers as equals	Students treat teachers with respect
More educated persons hold less authoritarian values than less educated persons	Both more and less educated persons show almost equally authoritarian values
Hierarchy in organizations means an inequality of roles, established for convenience	Hierarchy in organizations reflects the existential inequality between higher-ups and lower-downs
Decentralization is popular	Centralization is popular
Narrow salary range between top and bottom of organization	Wide salary range between top and bottom of organization
Subordinates expect to be consulted	Subordinates expect to be told what to do
The ideal boss is a resourceful democrat	The ideal boss is a benevolent autocrat or good father
Privileges and status symbols are frowned upon	Privileges and status symbols for managers are both expected and popular

Appendix A (continued)

Hofstede's Key Dimensional Differences for Uncertainty Avoidance (UAI)

Key differences between weak and strong UAI societies for general norm, family, school, and workplace.

<i>Weak Uncertainty Avoidance</i>	<i>Strong Uncertainty Avoidance</i>
Uncertainty is a normal feature of life and each day is accepted as it comes	The uncertainty inherent in life is felt as a continuous threat which must be fought
Low stress; subjective feeling of well-being	High stress; subjective feeling of anxiety
Aggression and emotions should not be shown	Aggression and emotions may at proper times and places be ventilated
Comfortable in ambiguous situations and with unfamiliar risks	Acceptance of familiar risks; fear of ambiguous situations and of unfamiliar risks
Lenient rules for children on what is dirty and taboo	Tight rules for children on what is dirty and taboo
What is different, is curious	What is different, is dangerous
Students comfortable with open-ended learning situations and concerned with good discussions	Students comfortable in structured learning situations and concerned with the right answers
Teachers may say 'I don't know'	Teachers supposed to have all the answers
There should not be more rules than is strictly necessary	Emotional need for rules, even if these will never work
Time is a framework for orientation	Time is money
Comfortable feeling when lazy; hard working only when needed	Emotional need to be busy; inner urge to work hard
Precision and punctuality have to be learned	Precision and punctuality come naturally
Tolerance of deviant and innovative ideas and behavior	Suppression of deviant ideas and behavior; resistance to innovation
Motivation by achievement and esteem or belongingness	Motivation by security and esteem or belongingness

Appendix A (continued)

Hofstede's Key Dimensional Differences for Individualism (IDV)

Key differences between collectivist and individual societies for general norm, family, school, and workplace.

<i>Collectivist</i>	<i>Individualist</i>
People are born into extended families or other in-groups which continue to protect them in exchange for loyalty	Everyone grows up to look after him/herself and his/her immediate (nuclear) family only
Identity is based on the social network to which one belongs	Identity is based on the individual
Children learn to think in terms of 'we'	Children learn to think in terms of 'I'
Harmony should always be maintained and direct confrontations avoided	Speaking one's mind is a characteristic of an honest person
High-context communication	Low-context communication
Trespassing leads to shame and loss of face for self and group	Trespassing leads to guilt and loss of self-respect
Purpose of education is learning how to do	Purpose of education is learning how to learn
Diplomas provide entry to higher status groups	Diplomas increase economic worth and/or self-respect
Relationship employer-employee is perceived in moral terms, like a family link	Relationship employer-employee is a contract supposed to be based on mutual advantage
Hiring and promotion decisions take employees' in-group into account	Hiring and promotion decisions are supposed to be based on skills and rules only
Management is management of groups	Management is management of individuals
Relationship prevails over task	Task prevails over relationship

Appendix A (continued)

Hofstede's Key Dimensional Differences for Masculinity (MAS)

Key differences between feminine and masculine societies for general norm, family, school, and workplace.

<i>Feminine</i>	<i>Masculine</i>
Dominant values in society are caring for others and preservation	Dominant values in society are material success and progress
People and warm relationships are important	Money and things are important
Everybody is supposed to be modest	Men are supposed to be assertive, ambitious, and tough
Both men and women are allowed to be tender and to be concerned with relationships	Women are supposed to be tender and to take care of relationships
In the family, both fathers and mothers deal with facts and feelings	In the family, fathers deal with facts and mothers with feelings
Both boys and girls are allowed to cry but neither should fight	Girls cry, boys don't; boys should fight back when attacked, girls shouldn't fight
Sympathy for the weak	Sympathy for the strong
Average student is the norm	Best student is the norm
Failing in school is a minor accident	Failing in school is a disaster
Friendliness in teachers appreciated	Brilliance in teachers appreciated
Boys and girls study same subjects	Boys and girls study different subjects
Work in order to live	Live in order to work
Managers use intuition and strive for consensus	Managers expected to be decisive and assertive
Stress on equality, solidarity, and quality of work life	Stress on equity, competition among colleagues, and performance
Resolution of conflicts by compromise and negotiation	Resolution of conflicts by fighting them out

Appendix B

Flight Management Attitude Questionnaire (FMAQ) Items

- Power Distance dimension (PDD):

1. I expect to be consulted on matters that affect the performance of my duties.^a
2. Senior staff deserve extra benefits and privileges.^a
3. Captains who encourage suggestions from crew members are weak leaders.^a
4. Junior crew members should not question the captain's or senior crew members' decisions.^a
5. Crew members share responsibility for prioritizing activities in high workload situations.^a
6. In abnormal situations, I rely on my superiors to tell me what to do.^a
7. How frequently in your work environment are subordinates afraid to express disagreement with their superiors?^b
8. Which one of the above styles of leadership would you most prefer to work under? (see four styles below)
9. In your organization, which one of the above styles do you find yourself most often working under? (see four styles below)

Style 1. Usually makes his/her decisions promptly and communicates them to his/her subordinates clearly and firmly. Expects them to carry out the decisions loyally and without raising difficulties.

Style 2. Usually makes his/her decisions promptly, but, before going ahead, tries to explain them fully to his/her subordinates. Gives them the reasons for the decisions and answers whatever questions they may have.

Style 3. Usually consults with his/her subordinates before he/she reaches his/her decisions. Listens to their advice, considers it, and then announces his/her decision.

He/she then expects all to work loyally to implement it whether or not it is in accordance with the advice they gave.

Style 4. Usually calls a meeting of his/her subordinates when there is an important decision to be made. Puts the problem before the group and invites discussion. Accepts the majority viewpoint as the decision.

Uncertainty avoidance dimension (UAD):

1. I work better when the operating procedures are flexible.^a
2. The organization's rules should not be broken — even when the employee thinks it is in the organization's best interests.^a
3. Written procedures are necessary for all in-flight situations.^a
4. During periods of low work activity, I would rather relax than keep busy with small tasks.^a
5. I like my job.^a
6. Uncertain situations often require quick decision making.^a
7. How often do you feel nervous or tense at work?^d
8. Know everything about that job, to have no surprises?^c
9. Have a changing work routine with new, unfamiliar tasks?^c
10. Have the time to consider more than one solution to a problem?^c

Individualism (IDV):

1. It makes no difference to me which company I fly for.^a
2. It is better to agree with other crew members than to voice a different opinion.^a
3. If I perceive a problem with the flight, I will speak up, regardless of who might be affected.^a
4. To resolve conflicts, crew members should openly discuss their differences with each other.^a

5. Work in an environment where the group's achievements are valued over your individual success?^c
6. Live in area desirable to you and your family?^c
7. Have considerable freedom to adopt your own approach to the job?^c
8. Have challenging tasks to do, from which you can get a personal sense of accomplishment?^c
9. Have sufficient time left for your personal or family life?^c
10. Work with people who cooperate well with one another?^c

Masculinity (MAS):

1. Maintain good interpersonal relationships with fellow workers or crew members?^c
2. Have an opportunity for advancement to higher-level jobs?^c
3. Have security of employment?^c
4. Have a warm relationship with your direct superior?^c
5. Have an opportunity for high earnings?^c
6. Have challenging tasks to do, from which you can get a personal sense of accomplishment?^c
7. Work with people who cooperate well with one another?^c
8. Have a job or career that will bring you prestige and recognition from others?^c

^a1=agree strongly; 2=agree slightly; 3=neutral; 4=disagree slightly; 5=disagree strongly.

^b1=very infrequently; 2=frequently; 3=sometimes; 4=seldom; 5=very seldom.

^c1=very little or no importance; 2=little importance; 3=moderate importance; 4=very important; 5=utmost importance.

^d1=I always feel this way; 2=I usually feel this way; 3=I sometimes feel this way; 4=I seldom feel this way; 5=I never feel this way.