



Australians in Antarctica:
A study of organizational culture

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TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES	viii
LIST OF APPENDICES.....	ix
ABSTRACT	x
STATEMENT	xiv
ACKNOWLEDGMENTS	xv
CHAPTER 1	1
1.1 Organizational Culture.....	2
1.1.1 Background.....	2
1.1.2 Organizational Culture Defined.....	4
1.1.3 Elements of Organizational Culture	5
1.1.4 Assessment of Organizational Culture	13
1.1.5 Person-Culture Fit.....	18
1.2 Antarctica.....	22
1.2.1 Background.....	22
1.2.2 History	23
1.2.3 Australian National Antarctic Research Expeditions	24
1.2.4 Women and ANARE	27
1.2.5 Australian Antarctic Stations.....	31
1.2.6 The Application and Selection Process	33
1.2.7 ANARE research	38
1.2.8 This Research Investigation.....	43
CHAPTER 2	47
2.1 Introduction.....	48
2.2 Method.....	48
2.2.1 Participants	48
2.2.2 Procedure	50
2.3 Results and Discussion	52
2.3.1 The best aspect of Antarctica.....	52
2.3.2 The worst aspect of Antarctica	53
2.3.3 Is Antarctica a good place to work?.....	55
2.3.4 Fitting in to Antarctic station culture.....	56
2.3.5 Characteristics of a good Station Leader	57
2.3.6 The culture of Antarctic stations.....	59
2.3.7 Cultural change in Antarctica	61

2.4	Elements of Antarctic Station Culture.....	68
2.4.1	Symbols of Antarctic station culture	68
2.4.2	Heroes and Legends.....	72
2.4.3	Rituals.....	73
2.4.4	Stories	75
2.5	Values.....	77
2.5.1	Values not sought in expeditioners.....	79
2.6	The most salient aspects of Antarctic stations.....	79
2.7	General Discussion	82
CHAPTER 3		87
3.1	Introduction.....	88
3.2	Method.....	88
3.2.1	Participants	88
3.2.2	Procedure	90
3.3	Results and Discussion	90
3.3.1	The natural Antarctic environment.....	91
3.3.2	Antarctic station culture.....	92
3.4	General Discussion	98
CHAPTER 4		101
4.1	Introduction.....	102
4.2	Method.....	104
4.2.1	Participants	104
4.2.2	Measures.....	110
4.2.3	Procedure	113
4.3	Results	114
4.3.1	Person-Organization fit.....	114
4.3.2	The Antecedents of fit	118
4.3.3	The Outcomes of fit.....	120
4.3.4	Antarctic station values.....	125
4.4	General Discussion	131
4.4.1	Implications	134
4.4.2	Limitations & Future research	136
CHAPTER 5		138
5.1	Introduction.....	139

5.2	Method.....	140
5.2.1	Participants	140
5.2.2	Measures.....	141
5.2.3	Procedure	144
5.3	Results	144
5.3.1	Perceived behavioural norms and expectations.....	148
5.3.2	Control variables.....	149
5.3.3	Station subcultures.....	163
5.3.4	Outcome Variables	163
5.4	General Discussion	168
CHAPTER 6		172
6.1	Introduction.....	173
6.2	Method.....	176
6.2.1	Participants	176
6.2.2	Measures.....	176
6.2.3	Procedure	179
6.3	Results	180
6.3.1	The Personality of the Australian Antarctic Expeditioner.....	180
6.3.2	Personality, Antarctic station culture and person-culture fit	182
6.3.3	Links between Personality and perceptions of Antarctic culture.....	188
6.3.4	Links between Personality and Subjective Fit perceptions.....	190
6.3.5	Links between Personality and Outcomes	191
6.4	General Discussion	193
6.4.1	Implications	194
6.4.2	Limitations & Future research	195
CHAPTER 7		196
7.1	Study I.....	197
7.2	Study II.....	199
7.3	Study III	200
7.4	Study IV	202
7.5	Study V	204
7.6	Research Implications.....	205
7.7	Implications for ANARE	208
7.8	Limitations and future research	209

APPENDICES	211
REFERENCES	239

LIST OF TABLES

		Page
TABLE 2.1	Demographic information for Study I	49
TABLE 2.2	Questions to Part 1 of Interview Schedule	50
TABLE 2.3	Questions to Part 2 of Interview Schedule	51
TABLE 3.1	Demographic Information for Study II	89
TABLE 3.2	Interview Schedule for Study II	90
TABLE 4.1	Demographic Information for Study III	105
TABLE 4.2	Educational Qualifications	108
TABLE 4.3	Location of last Expedition	109
TABLE 4.4	Means, Standard Deviations and Correlations among Variables for Study III	116
TABLE 4.5	Regression Estimates Predicting Subjective Fit Perceptions	119
TABLE 4.6	Hierarchical Regression Estimates Predicting Subjective Fit Perceptions	120
TABLE 4.7	Regression Estimates Predicting Job Satisfaction and Intention to Return	122
TABLE 4.8	Regression Estimates Predicting Willingness to Recommend and Return	123
TABLE 4.9	Regression Estimates Predicting Group Cohesion	124
TABLE 4.10	Hierarchical regression Estimates Predicting Group Cohesion Perceptions	124
TABLE 4.11	Regression Estimates Testing Mediation of Values Congruence on Job Satisfaction and Perceived Group Cohesion	125
TABLE 5.1	Demographic Information for Study IV	142
TABLE 5.2	Descriptive Statistics for the 12 OCI Subscales	145

		Page
TABLE 5.3	Rotated Factor Loadings for the 12 OCI Subscales	147
TABLE 5.4	ANOVA of OCI Subscales and Factors by Gender	151
TABLE 5.5	ANOVA of OCI Subscales and factors by Expedition Year	156
TABLE 5.6	Mean OCI Scores for Men by Decade	157
TABLE 5.7	ANOVA of OCI Subscales and Factors by Station Position	160
TABLE 5.8	ANOVA of OCI Subscales and Factors by Age	161
TABLE 5.9	ANOVA of OCI Subscales and Factors by Expedition	162
TABLE 5.10	Outcome Variable Means, standard Deviations, and Correlations between Outcome variables and 3 OCI Groupings	166
TABLE 5.11	Multiple Regression of Culture Styles and Outcome Variables	167
TABLE 6.1	Factor means by gender; Australian Antarctic sample and Normative Sample	182
TABLE 6.2	Means, Standard Deviations and Correlations among Variables for Study V	184
TABLE 6.3	Standard Regression Coefficients for five Personality Traits as Predictors, and twelve Perceptions of Antarctic Station Culture Variables as Separate Criteria	189
TABLE 6.4	Hierarchical Regression Estimates Predicting Subjective Fit Perceptions	190
TABLE 6.5	Standard Regression Coefficients for five Personality Traits as Predictors, and seven Outcome Variables as Separate Criteria	192

LIST OF FIGURES

		Page
FIGURE 1.1	Schein's Organizational Model	6
FIGURE 1.2	Rousseau's Model of Culture	8
FIGURE 4.1	Percentage of Men and Women in Winter and Summer Expeditions	107
FIGURE 4.2	Percentage of Men and Women with Qualifications at each level	108
FIGURE 4.3	Values identified as least characteristic and most characteristic of Antarctic station culture	129
FIGURE 4.4	Values identified as least desirable and most desirable in the ideal organization	130
FIGURE 5.1	OCI Profile of Antarctic Station Culture (men and women)	150
FIGURE 5.2	OCI Profile for Men	153
FIGURE 5.3	OCI Profile for Women	154

LIST OF APPENDICES

	Page
APPENDIX A1: Gender on Ice	212
APPENDIX A2: EEO Recommendations	213
APPENDIX A3: ANARE selection process	216
APPENDIX A4: Approved ASAC Projects	217
APPENDIX B1: Symbols, heroes, rituals, and stories	218
APPENDIX B2: A list terms and meanings	220
APPENDIX C1: Additional Demographic information (Study II)	221
APPENDIX D1: Number of expeditions per person (Study III)	222
APPENDIX D2: Frequency distribution of expedition year(last)	223
APPENDIX D3: Organizational Culture Profile I	224
APPENDIX D4: Organizational Culture Profile Item set	225
APPENDIX D5: Organizational Culture Profile II	226
APPENDIX D6: O'Brien Scale items	227
APPENDIX D7: Cohesion scale items	228
APPENDIX D8: Results of Factor Analysis	229
APPENDIX E1: The 12 OCI subscales and cultural styles	230
APPENDIX E2: The 3 OCI factors	232
APPENDIX E3: The 96 items of the OCI	233
APPENDIX E4: The 6 item subscales	234
APPENDIX F1: The 5 Domains of the NEO PI-R	235
APPENDIX F2: The NEO PI-R Facet Scales	236
APPENDIX F3: NEO PI-R Facet scale mean scores	237
APPENDIX F4: Intercorrelations of 3 OCI Culture Factors and NEO PI-R Facet scales	238

ABSTRACT

The principal aim of this thesis was to investigate the culture of isolated Australian Antarctic stations using qualitative and quantitative research methods. The research also investigated the assessment of person-culture fit within the context of Antarctic station life and culture. Five studies were undertaken on returned Australian Antarctic expeditioners and the results reflect a historical overview of Antarctic station culture from 1950 to 1999.

The first study was a qualitative investigation that explored the culture of Australian Antarctic stations using a two-part interview with a group of 31 returned Australian National Antarctic Research Expeditioners (ANARE). The investigation examined the experiences and attitudes of men and women towards Antarctic station life and culture. It also identified specific elements of Antarctic station culture, including symbols, heroes, rituals, stories, values, and the characteristics required for good “fit” into Antarctic station life. On the basis of a thematic analysis, a series of issues were identified, including: (i) the existence of two distinct eras of Antarctic station culture; (ii) the perceived ascendancy of occupational competence over social competence in expeditioner screening and recruitment; (iii) discrepancies between the values espoused in new recruits and the behavioural norms of Antarctic stations; (iv) the residual influence of the early all-male era of ANARE on subsequent Antarctic station culture; and (v) the impact of interpersonal conflict on stations, particularly gender based problems following the introduction of women to ANARE.

The results of Study I provided support for a second follow-up qualitative investigation on the attitudes and experiences of women towards Antarctic station life and culture. In particular, Study II was undertaken to: (i) further explore gender issues identified in Study I using a larger group of women expeditioners; and (ii) explore the extent of “fit” of women into Antarctic station life and culture. The participants were 14 women who participated in expeditions to the Antarctic and sub-Antarctic between 1985 and 1999 in a range of positions. The group included station leaders, medical practitioners, chefs, scientists, meteorological technicians and communications personnel. The women were administered the same interview used in Study I. Thematic analysis of the information

identified a series of recurring social issues, including: the prevalence of a male dominated workers culture; sexual harassment and discrimination; group friction between scientists and support staff; and a discrepancy between espoused values and values expeditioners required in order to “fit” into station culture.

On the basis of the information and themes identified in Studies I and II, it was possible to formulate hypotheses about underlying assumptions of Antarctic station culture according to past theoretical models of organizational culture (Schein, 1984 and Rousseau, 1990a, 1990b) and person-culture fit (Chatman, 1989), and to explore these hypotheses using quantitative research methods. Study III was undertaken to explore the quantitative assessment of Antarctic station culture and the notion of person-culture fit within the context of Antarctic station life. The investigation was also undertaken to determine the extent to which congruence between individual and organizational values affects individual attitudes and job outcomes, including subjective fit perceptions, job satisfaction and perceived group cohesion. Person-culture fit was assessed in terms of the congruence between perceived Antarctic station values and individual values using the Organisational Culture Profile (O'Reilly, Chatman and Caldwell, 1991), which is an idiographic measure of organizational culture based on Q-sort methodology. The study was undertaken on a group of 117 men and women who participated in Australian Antarctic expeditions between 1950 and 1999. The group included station leaders, medical practitioners, chefs, scientists, meteorological technicians and trades and communications personnel. The results of the study revealed that congruence between Antarctic station values and individual values, along with demographic characteristics such as age and gender, predicted subjective fit with Antarctic station culture. The results also showed that person-culture fit predicted job satisfaction and group cohesion, and consistent with the findings of the qualitative studies, two distinct eras of Antarctic station culture were identified.

In order to further explore the quantitative assessment of organizational culture and the extent to which specific dimensions of Australian Antarctic station culture could be identified, a second quantitative study was undertaken. While Study III focused on Antarctic station values, the principal aim of Study IV was to identify the behavioural norms and expectations considered characteristic of station culture since behavioural

norms and values are considered distinct elements of culture (Rousseau, 1990a). The study also explored the impact of behavioural norms and expectations on individual attitudes and job outcomes, including job fit, role clarity, role conflict and job satisfaction. The study was undertaken on a group of 116 expeditioners drawn from the sample used in Study IV. The Organizational Culture Inventory (Cooke and Lafferty, 1989), which is a normative measure of organizational culture, was used to identify Antarctic station norms and expectations. The results of Study IV revealed gender differences in perceptions of Antarctic station culture. The results also highlighted that different behavioural norms and expectations were reported by: (i) those who participated in expeditions prior to 1980 and those who participated in expeditions from 1980 onwards; (ii) expeditioners of different station positions; and (iii) those who participated in summer expeditions and those who wintered in Antarctica.

A third quantitative study of Antarctic station culture was undertaken using the same participants to examine the extent to which perceptions of Antarctic station behavioural norms and expectations were consonant with certain personality traits. Accordingly, Study V explored the relationship between personality and perceived fit into Antarctic station culture, and the relationship between personality and individual job outcomes. Personality was assessed using the Revised NEO Personality Inventory (NEO PI-R; Costa and McCrae, 1992), which is based on a five factor model of personality (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness). The results identified links between personality traits and perceptions of culture, subjective fit perceptions, and individual attitudes and job outcomes.

The results of this investigation show that organizational culture is amenable to both quantitative and qualitative assessment. In particular, results show the effectiveness of combining qualitative and quantitative research methods to assess the deeper levels of organizational culture, including values, behavioural norms, and underlying unconscious assumptions (eg., concerning gender roles, with women being less likely to fit into the prevailing male dominated workers culture on stations). The results also show that congruence between perceived organizational values and individual values is effective in determining the extent to which individuals are likely to perceive themselves as “fitting in” to Antarctic station culture. This investigation generated a profile that represents the

development of Australian Antarctic station values and behavioural norms since the establishment of ANARE. The data reflect the evolution of Antarctic station culture over time and may be useful for the ongoing monitoring of Australian Antarctic station culture and similar investigations on other international Antarctic bases. This investigation also identified the requirements of “good fit” into Antarctic station life. In particular, it considered the extent to which “good fit” with the prevailing culture is desirable given recurring social problems on stations. Although the results suggest that Australian Antarctic station culture is in transition, further change may be facilitated through intervention to ensure Antarctic station culture is better aligned with ANARE goals and practices, and that recurring social problems are adequately addressed through a managed change process.

STATEMENT

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Signed _____

Date 17.4.2002

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CHAPTER 1

Review of the Literature

1.1 Organizational Culture

1.1.1 Background

Organizational culture has its roots in anthropology and early folklore and ethnographic research. Examples of early ethnographic research include Margaret Meads' *Coming of Age in Samoa* (1928), an account of fieldwork that Mead embarked on in 1925 to study adolescence in Samoa, and William Whytes' *Street Corner Society* (1949), a sociological study of an American slum district community undertaken in the late 1930's. From the 1940s onwards, the concept of organizational culture received the attention of researchers across a range of disciplines, including anthropology, sociology and psychology (eg., Chapple, 1941, 1943; Roy, 1952, 1954, 1960; Whyte, 1949, 1951, 1961; Jacques, 1951; Pettigrew, 1973; Trice, Belasco and Alutto, 1969; Ouchi, 1981; Peters and Waterman, 1982; Schein, 1981, 1983, 1984, 1985, 1990)¹.

Researchers across these disciplines have held varying conceptions of organizational culture and these differences have given rise to different research questions and interests. Studies have also explored the culture concept from a number of perspectives. Some studies have treated management as symbolic activity (eg., Alvesson, 1987; Alvesson and Berg, 1992; Pettigrew, 1979; Putnam, 1983) while others have focused on organizational *symbols, rituals, stories and legends* (eg., Pedersen and Sorensen, 1989). The popular use of the culture concept in recent years and the tendency to apply the culture label to "everything from common behavioural patterns to espoused corporate values" (eg., Deal and Kennedy, 1982; Peters and Waterman, 1982) has increased the lack of consistency and agreement across disciplines regarding its meaning (Schein, 1990, p109). In this regard, before embarking on organizational analysis, researchers need to consider that organizational culture is an interdisciplinary concept and its application in organizational research is characterised by a variety of assumptions, perceptions and conceptions about the nature of culture and organizations that reflect the biases of each discipline (Smircich 1983; Schein, 1990). As Smircich (1983) asserts, "when the literature is regarded in this way the concept of culture becomes highly suggestive and promising for many different ends that researchers pursue" (p. 340).

Although the concept of culture has been central to anthropology and folklore studies for over a century, the concept of organizational culture is a relatively recent development in

the field of psychology. Although psychologists have used concepts such as 'climate' and 'group norms' for many years, the concept of organizational culture has only been explicitly used in the last few decades (Schein, 1990). Within the field of psychology, the concept emerged in the 1950s when organizational psychology began to emerge as a field of study and differentiated itself from industrial psychology. As industrial psychologists tested recruits in order to improve the assessment and selection methods used by government, military forces and larger industrial organizations, many began to realise that within the context of an organization, individuals are a part of whole social system and, in order to understand the behaviour of individuals, one needs to understand the functioning of the entire social system (Schein, 1970).

Organizational psychology as a field of study is therefore associated with an interactional perspective characterised by a movement away from the individual-oriented approach of early industrial psychologists, to a systems-oriented approach characterised by a focus on the behaviour of groups as complex social systems. This movement represented a shift of focus from the behaviour of the individual to aspects of both the individual and his/her social environment (O'Reilly, Chatman and Caldwell, 1991). Furthermore, as psychologists began to explore phenomena such as *group stability* and variations in patterns of organizational behaviour, the concept of organizational culture emerged, and in order to explore organizational culture, sociological and anthropological concepts and research methods were applied to the field of psychology².

In psychology, the work of Edgar Schein (1981, 1983, 1984, 1985), in particular, has been highly influential because Schein developed the first comprehensive model for analysing the culture of organizations. Today, the study of organizational culture constitutes a growing area of research within the field of organizational psychology, fully equipped with conceptual models, theories and research methods. It has become a major issue in organizational research, theory and management practices and is argued to be the key to competitive advantage and organizational excellence: "all of the activities that revolve around (an organization's) recruitment, selection, training, socialization, the design of reward systems, the design, and description of jobs and broader issues of organization

¹Refer to Schein (1980) and Hatch (1993) for a detailed review of the historical development of organizational culture as a concept.

²For a detailed discussion of the forces that stimulated the emergence of organizational psychology refer to Schein (1970) p. 4-5.

design require an understanding of how culture influences present functioning. Many organizational change programs that failed probably did so because they ignored cultural forces in the organization in which they were to be installed” (Schein, 1990, p. 118).

1.1.2 Organizational Culture Defined

Organizational culture may be defined as a set of cognitions that are shared by the members of a given organization or unit and guide their behaviour. These cognitions may be learned by members and manifest themselves in physical artefacts and symbols, patterns of behaviour and communication, behavioural norms, values and fundamental assumptions, which vary in terms of the degree to which they are immediately visible to an outsider.

Culture binds the members of a group together and hence group culture cannot be determined unless there is a definable group of people with a shared history. As Schein asserts, “there cannot be a culture unless there is a group that owns it. If we want to define a cultural unit, we must be able to locate a group that is independently defined as the creator, host or owner of that culture” (Schein, 1984, p. 266). A group may be defined as a set of people who: (i) have been together long enough to have shared significant problems; (ii) have had opportunities to solve those problems and to observe the effects of their solutions; and (iii) have taken in new members. In order to understand the significance of organizational culture, one therefore needs to understand something about groups, for the former can only exist within the context of the latter.

Edgar Schein established the first formal definition of organizational culture. Schein’s definition emphasised the evolving and changing nature of culture. He defined it as: “(i) a pattern of basic assumptions, (ii) invented, discovered, or developed by a given group, (iii) as it learns to cope with its problems of external adaptation and internal integration, (iv) that has worked well enough to be considered valid and, therefore (v) is to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (Schein, 1990, p. 111).

Although numerous definitions of culture may be cited in the literature, they differ only in terms of the elements of definition and assessment. For instance, Cooke and Rousseau (1988) refer to culture as “shared beliefs and values guiding the thinking and behavioural

styles of members”, and other definitions refer to “the notion of a set of common understandings” (Becker and Geer, 1970), “shared patterns of meanings” (Martin and Siehl, 1983) “shared values” (Uttal, 1983, cited by Cooke and Rousseau, 1988) or “symbols, ceremonies and myths” (Ouchi, 1981). Consequently, researchers have often assessed widely different elements of culture.

1.1.3 Elements of Organizational Culture

According to Schein (1984) organizational culture can be analysed at several different levels. The first level of culture (surface level) can be established from *visible artefacts*, which are visible but often not interpretable. Visible artefacts may include the physical environment, office space, dress codes, and documents such as strategic plans and annual reports, which describe how the organization constructs its environment and the behaviour patterns which distinguish it. The second level comprises the espoused *values* of a culture (eg., what people say is the reason for their behaviour). Schein argues that since the underlying reasons for people’s behaviour often remain concealed and may be subconscious, it is important to identify the underlying *basic assumptions*, the third and deepest layer of the model. Assumptions are learned and guide people’s perceptions, attitudes and behaviour towards their work, performance and relationships with colleagues, in ways that are characteristic of their organization. Figure 1.1 contains the three layers of Schein’s model of organizational culture (Schein, 1984).

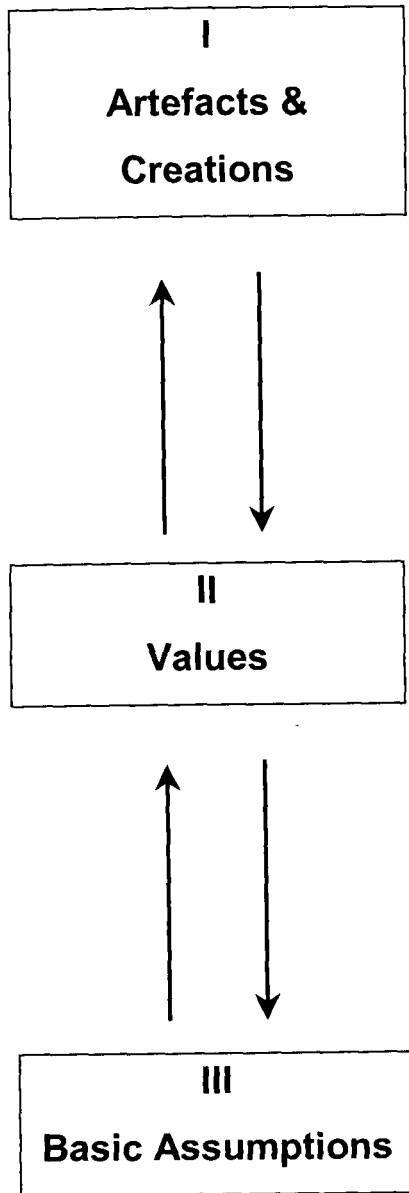


Figure 1.1: Schein's three-layer organizational model (1988).

Rousseau (1990a) proposed a similar framework of culture depicting the elements as layers with varying accessibility. The framework includes behavioural norms and expectations and patterns of behaviour as distinct elements of culture (Figure 2). At the perimeter are *artefacts*, which are observable to the outsider. *Patterns of behaviour*, including decision-making, coordination and communication, which are also observable, comprise the second layer of culture. The third layer consists of *behavioural norms* (i.e. member beliefs about acceptable and unacceptable behaviours), which are usually more difficult to observe without direct information from members. The fourth layer consists of *values* and refers to priorities assigned to certain states or outcomes (eg., “innovation” versus “predicability” and “risk seeking” versus “risk avoidance”). Finally, fundamental *unconscious assumptions* form the inner most layer of the model and require the researcher’s participation for assessment. According to Rousseau (1990a), the various layers of culture are amenable to different research techniques. Whilst artefacts, norms and values are accessible and can be assessed by standardized and non-standardized assessments, underlying assumptions are usually unconsciously held and are therefore difficult to assess without interactive probing.

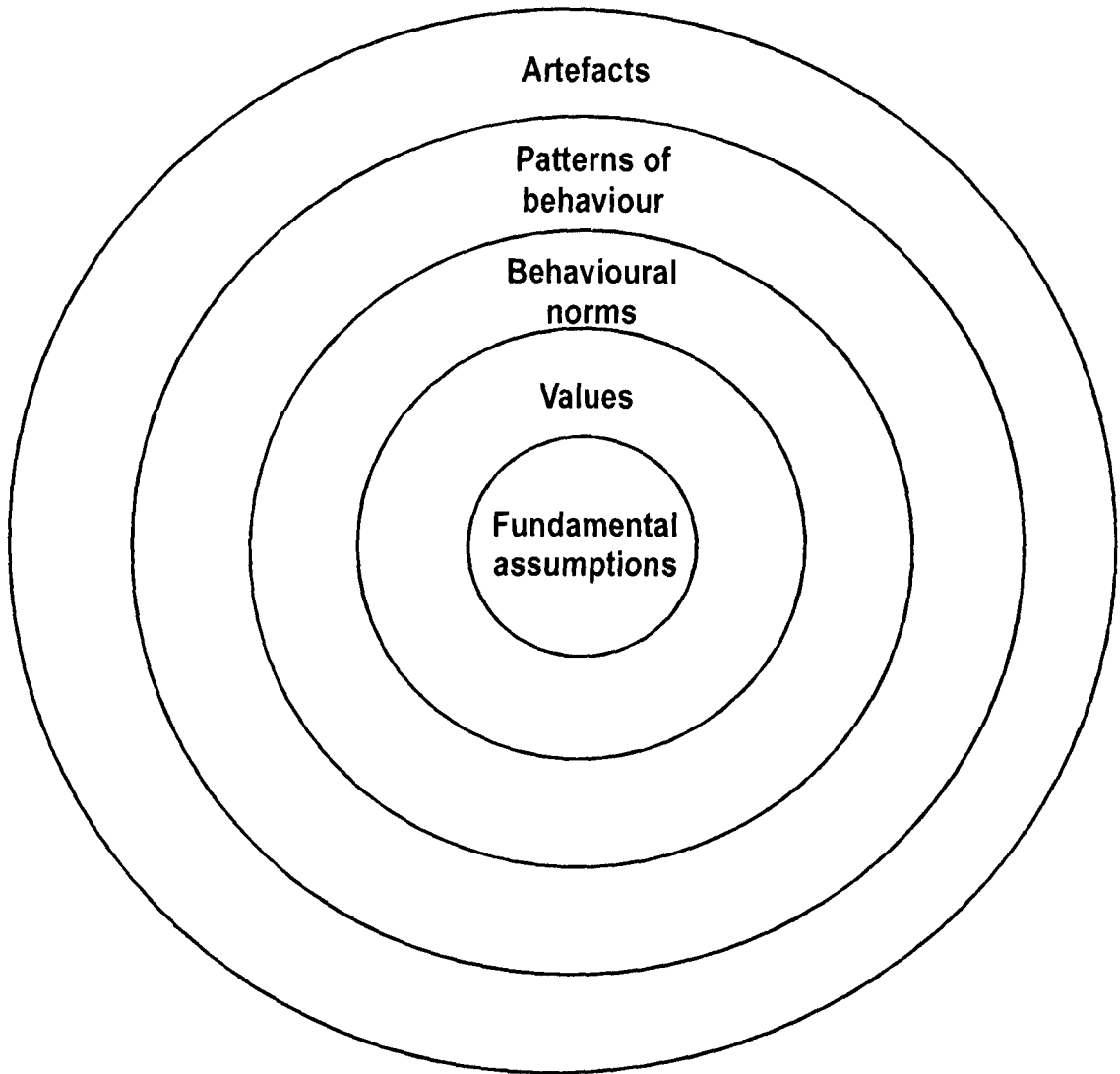


Figure 1.2: Rousseau's five-layer model of culture
(Rousseau, 1990a, p. 158)

Development of culture

Researchers generally highlight the fact that organizational culture is learned and taught to members and that it perpetuates and reproduces itself through the socialization of new members (Schein, 1984, 1990; Chatman, 1991). According to Schein (1984, 1985) for a culture to exist, function properly and reproduce itself, it needs to be passed on to new members who, in turn, may bring new ideas and may produce some cultural change, particularly if they are recruited to senior positions. Socialization is defined as the process by which an individual comes to understand the beliefs, values, norms and underlying assumptions that are essential to his or her inclusion and participation within an organization or group. It is also considered to be the process by which organizational culture develops and evolves (Schein, 1984, 1990; Chatman, 1991).

Past theoretical research suggests that the more an organization focuses on influencing its members, the more similar the members' values become to those of the organization since socialization teaches individuals to think and behave in a certain way (e.g., Reichers 1987; Schein, 1990; Chatman, 1991). According to Schein (1990), organizational behavioural norms develop through critical incidents and modelling by leaders and, in order to demonstrate how group norms and beliefs arise from critical incidents, Schein (1990) cites the following example:

Something emotionally charged or anxiety producing may happen, such as an attack by a member on a leader. Because everyone witnesses it and because tension is high when the attack occurs, the immediate next set of behaviours tends to create a norm. Suppose for example that the leader counterattacks, that the group members concur with silence or approval, and that the offending member indicates with an apology, that he or she accepts his or her mistakes. In those few moments a bit of culture has begun to be created - the norm that "we do not attack the leader in this group; authority is sacred" (p. 115).

According to Chatman (1991), in a given group or organization, member interaction facilitates "sense-making, situational identification and acculturation among recruits" because new members rely on the values demonstrated by others, particularly senior members and leaders, as reference points for their own actions and behaviours (p. 462). Similarly, Schein (1990) asserts that modelling by leaders is a fundamental aspect of culture creation and that when groups are first established, the beliefs, values and assumptions exhibited and communicated by founding members and leaders provide a model for the group's structure and function. Schein (1990) also argues that shared

assumptions usually emerge from the founding members' belief system and develop over time as new leaders attempt to embed their own values upon the emerging group culture using "primary embedding mechanisms", including: (i) what leaders focus on, measure and control; (ii) how leaders react to critical incidents, problems and crises; (iii) the extent of role modelling and coaching; (iv) the criteria used to reward and punish; and (v) the criteria for selection, recruitment, promotion and excommunication. In addition, Schein argues that leaders may also use "secondary articulation and reinforcement mechanisms", including: (i) the organization's layout and structure; (ii) organizational systems and processes; (iii) the physical appearance of buildings and accommodation; (iv) stories, legends, myths and symbols; and (v) formal statements of organizational philosophy and goals, such as strategic plans (p. 115).

Organizational subcultures

Past research suggests that organizations consist of distinctive subgroups or subcultures rather than a single homogenous cultural entity (eg., Schein, 1984, 1985; Cooke and Rousseau, 1988; Trice and Beyer, 1993). For instance, Cooke and Rousseau (1988) found that organizations they surveyed were strongly subcultural by function and hierarchical by level. In particular, these researchers found that higher organizational levels were characterised by different norms compared to lower organizational levels, suggesting a link between organizational structure and the formation of subcultures.

According to Trice and Beyer (1993), organizations are prone to the development of subcultures because the structure of most organizations encourages differential interaction among members. These authors argue that factors such as organizational size, the extent to which subgroups and subdepartments exist, and the occupational and demographic mix of individuals are considered to contribute to differential interaction among members. According to Trice and Beyer (1993), the development of organizational subcultures is facilitated by members' shared experience and personal characteristics. Shared experience refers to the extent to which members have shared a significant number of important events requiring them to deal with problems of external adaptation and internal integration, whilst personal characteristics include members' age, gender, occupation, education and social class (Schein, 1984). According to Trice and Beyer (1993), personal characteristics draw some members together on the basis of similarities whilst setting others apart on the basis of identified differences. Further, although conflicts between occupational

subgroups and other organizational subcultures, and between subcultures and management exist, an individual's allegiance to a given subculture does not necessarily lessen their allegiance or loyalty to the larger organization, since individuals can be equally and simultaneously committed to both (Trice and Beyer, 1993; Kummerow, 2000).

According to Martin and Siehl (1983), organizational subcultures can be classified into three distinct categories: (i) *enhancing* subcultures, (ii) *orthogonal* subcultures and (iii) *countercultures*. *Enhancing* subcultures exist within organizational groups which closely adhere to the core values of the dominant culture (eg., an enhancing subculture may develop among the founding members of an organization or those who have remained with it since its establishment). *Orthogonal* subcultures exist within organizational groups which tend to adhere to the core values of the dominant culture, whilst simultaneously adhering to a separate set of conflicting values unique to the group. The authors provide an example of an accounting department, and a research development department, within the same organization where both groups adhere to the values of the organization's dominant culture, while simultaneously maintaining distinct values associated with their own occupational groups. Finally, *countercultures* exist in organizational groups which possess core values that directly challenge those of the dominant culture. Martin and Siehl (1983) refer to their case study analysis of General Motors in order to demonstrate the development of a *counterculture*. In particular, the authors found evidence for the emergence of a *counterculture* when an incoming leader directly challenged the dominant organizational culture by: (i) focusing on distinct visible cultural artefacts; and (ii) articulating an alternative set of core values (eg., preferring productivity to deference, objective measures of performance to subjective indicators of conformity, and independence to loyalty).

According to Martin and Siehl (1983), dominant cultures and *countercultures* take opposite positions on values of central importance to both and form an "uneasy symbiotic relationship" (p. 63). However, the authors argue that "if a counterculture is to survive within the context of a dominant culture, a delicate balancing act must be performed" (p. 63). In particular, they assert that while managers may not be able to create or manage a culture, they can implement certain techniques that may impact upon the development of subcultures, including: (i) the implementation of practices consistent with preferred

cultural values; (ii) the creation of organizational stories; and (iii) the development of carefully selected artefacts consistent with the preferred organizational values.

Research by Bloor and Dawson (1992) found evidence for the subculture classification system identified by Martin and Siehl and identified two additional subculture types: *deferential* subcultures and *dissenting* subcultures. According to Bloor and Dawson, a *deferential* subculture is similar to an enhancing subculture with the exception that it defers to the values of the dominant culture, rather than closely adhering to them. A *dissenting* subculture on the other hand, is one in which members support the core values of the dominant culture, but advocate alternative strategies and work practices (Bloor and Dawson, 1992).

Cultural change

According to Schein (1990), there is constant pressure on any given organizational culture to evolve and develop. Changes in the environment (both internal and external) force new learning and adaptation and, just as individuals do not easily give up their own identity, groups similarly resist giving up their values, behavioural norms and underlying assumptions. However, past theoretical research suggests that organizations can be assisted to guide the direction of their evolution and change their culture (Schein, 1984, 1990). In particular, cultural elements viewed as desirable may be enhanced, whilst cultural elements considered detrimental may be 'unlearned' (Argyris and Schon, 1978; Argyris, Putnam and Smith, 1985; Walton, 1987; Hanna, 1988; Tushman and O'Reilly, 1997).

According to Tushman and O'Reilly (1997), managing cultural change involves moving an organization from its current state to its desired future state through a transition period. These researchers assert that certain leadership behaviours are vital to an organizations' transition, and ideally, change should be instigated by leaders in order to facilitate the transition process (eg., Schein, 1990; Tushman and O'Reilly, 1997). Schein (1990) highlights that one or all of the following strategies may be used to produce desired change: (i) leaders may instigate change by highlighting the threats to the organization if no change occurs, whilst at the same time encouraging members to believe that change is both highly desirable and possible; (ii) leaders may articulate a new direction and a new set of assumptions, in order to gather support for change; (iii) key positions in the

organization may be filled with new recruits who hold values consistent with the desired direction of cultural change; (iv) the adoption of the new direction by staff may be rewarded and encouraged and adherence to the old direction may be discouraged; (v) members of an organization may be coerced into adopting values and behaviour that are consistent with the new direction and new assumptions; (vi) organizational symbols, rituals and myths that preserve dysfunctional traditions may be discredited and artefacts, values, and norms linked to old assumptions may be destroyed; and (vii) leaders may create new symbols, rituals, and heroes around new assumptions using the embedding mechanisms described above.

Past theoretical research suggests that if an organization has strong subcultures, the change process may be facilitated with the appointment of leaders from subcultures that represent the desired new direction (Schein, 1990). However, in cases in which organizations become extremely maladapted, (eg., when organizations go bankrupt or require “turn-around” executives) change efforts may be more severe, and may include destroying the existing group and reconstructing it around new people to facilitate the development of a new culture.

1.1.4 Assessment of Organizational Culture

Although researchers generally conceptualise and define culture in a similar way (Rousseau, 1990a; O’Reilly et al., 1991), there is little agreement concerning the most effective method for assessing organizational culture. Traditionally, culture has been studied using qualitative research techniques comprising impressionistic data collection, interpretive analysis, and participant observation (Rousseau 1990a). Given that the concept of culture has its roots in anthropology and early ethnographic research, it has been linked with qualitative research methods traditionally associated with these disciplines. Despite this link, however, quantitative research techniques comprising the use of standardised assessment and statistical analysis have also been utilised to assess organizational culture. Such techniques usually involve structured procedures, questionnaires or Q-sorts, which facilitate the collection of data for statistical analysis.

Qualitative techniques

Qualitative methods typically involve participant observation or the recruitment of key informants. As Bryman (1989) suggests, in qualitative research: (i) the researcher may

adopt the stance of an insider to the organization; (ii) there is often a strong sense of context in that the researcher is able to describe what it is like to be a part of the organization through his/her participation in it; (iii) the emphasis is on process and the events occurring during the time of the researcher's participation and experience; (iv) the approach is unstructured; and (v) the investigation can employ a number of sources of data which can be used to check the validity of the information, including field notes, documents, and interview/conversation transcripts.

Methods of qualitative research include (Bryman, 1989):

- Participant observation - characterised by the researcher's immersion in the environment/organization to be studied in order to gain first hand knowledge of events and individuals. There are three forms of participant observation: (i) *covert* in which the researcher assumes a role and gains entry without others knowing, (ii) *full* which is the same as covert except that the researchers' true status is known, and (iii) *indirect* in which the researcher does not possess a work role but does participate in activities;
- Unstructured interviewing - which may include the use of aide-memoir notes to remind the researcher of the topics to be covered but no interview schedule as such (i.e. the interview is more like a conversation), or semi-structured interviewing in which an interview schedule is used but the researcher is willing to depart if the interviewee chooses to; and,
- Documents – used by researchers to obtain additional information that would not be readily obtainable using other methods.

There are essentially four types of qualitative research and each uses varying combinations of these methods (Bryman, 1989):

- Type 1 (total participation) in which the researcher is a member of the organization and covert or full participant observer;
- Type 2 (semi-participant) in which the researcher is not a member of the organization but an in-direct observer;
- Type 3 (interview-based) in which the researcher relies less on participant observation than Types one or two, and employs unstructured or semi-structured interviews and documents as sources of information; and
- Type 4 (multi-site) in which the researcher collects qualitative data from a number of organizations using different methods of data collection.

Despite the benefits of using qualitative methods for studying culture, there are disadvantages to qualitative approaches that need to be highlighted. First, qualitative methods employing ethnographic approaches to studying organizational culture are time consuming, and from a management perspective may therefore be impractical. Second, as Kummerow (2000) suggests, in reality organizational culture researchers are not always able to achieve the level of involvement necessary for 'good ethnography' (p. 94) and alternative approaches to studying culture are required. Third, qualitative studies employing ethnographic approaches may provide rich and valuable information on a single culture, but such methods are often difficult to repeat across different settings by different researchers. Finally, qualitative approaches are often more difficult to define and replicate than quantitative techniques (Bryman, 1989; Kummerow, 2000) and are more prone to researcher bias and the methodological problems that some researchers believe beset Margaret Mead in her ethnographic field study of adolescence in Samoa.³

Quantitative Methods

Unlike qualitative methods, quantitative research techniques utilise a standardised, pre-determined schedule to measure an aspect of culture. In quantitative research individuals are usually respondents, rather than informants, and these studies typically involve more members of an organization from a range of positions. However, as Rousseau (1990a) highlights, "quantitative assessment of culture is controversial" (p. 153) and consequently those who advocate qualitative methods maintain that the culture concept is a social construction that is unique to a given group and simply too abstract to be measured by standardized questionnaires (Louis 1983; Smircich, 1983; Rousseau, 1990a; Cooke and Rousseau, 1988; Schein, 1990). Schein (1984, 1990) asserts that the problem in using standardized questionnaires and surveys alone, is that these techniques assume the researcher has a knowledge of the relevant dimensions of the culture to be studied and can therefore speak for respondents rather than rely on the respondents' own words. Accordingly, survey techniques pre-judge the dimensions of culture to be studied. Conversely, advocates of quantitative methods for assessing culture argue that quantitative techniques are more practical because they include a common articulated frame of reference, which facilitates inter-group and intra-group comparisons, reliability of

³ According to some researchers there is evidence to suggest that Mead's findings were incorrect. For further discussion of these findings refer to Derek Freeman 's Margaret Mead and the Heretic: The making and unmaking of an anthropological myth, Penguin Books Australia, 1996.

assessment, and analysis of change over time (Cooke and Rousseau, 1988). These practical benefits overcome many of the limitations of qualitative research methods outlined above.

Researchers generally agree that in analysing the culture of an organization it is necessary to distinguish between the various levels or layers of culture (Rousseau, 1990a; Schein; 1984, 1990) and that quantitative methods, such as questionnaires or surveys are considered more effective in studying the more observable elements of culture, such as visible artefacts (Schein, 1984). According to Schein (1990), it is only with access to members of an organization and getting “insiders” involved in the research and intensive interviewing, that a researcher can decipher and understand the deeper levels of culture or the “underlying and usually unconscious assumptions that determine perceptions, thought processes, feelings and behaviour” (p. 112). Schein argues that the process required to identify underlying assumptions needs to be interactive, undertaken either by an ethnographer through participant observation, or a clinician through intensive interviewing when the organization chooses external intervention and assistance (Schein, 1990).

Rousseau (1990a) adopts a more open approach, emphasizing the benefits of both quantitative and qualitative approaches to the assessment of organizational culture. In particular, Rousseau asserts that there is a legitimate need for both qualitative and quantitative approaches in studies of organizational culture, and failure to apply both methods limits our understanding of it (p. 186).

Rousseau (1990a) reviewed the content and properties of seven examples of quantitative assessments of organizational culture, which focus on values, or the “middle range” cultural elements. The review concluded that although the measures varied in terms of content, three general categories expressed as either values or behaviours could be deciphered, comprising: (i) task related values and behaviours (eg., quality); (ii) interpersonal values and behaviours (eg., fairness); and (iii) individual values and behaviours designed to enhance members at a personal level (eg., flexibility).

Rousseau concluded that a limitation of most measures was the lack of reported consensual validity demonstrating the extent to which norms and values were consistently identified by members within a given organization. However, two measures reported to

have relatively high reliability, construct validity, consensual validity and criterion-related validity were the Organizational Culture Profile (OCP; O'Reilly, Chatman and Caldwell, 1991), and the Organizational Culture Inventory (OCI; Cooke and Rafferty, 1984; 1989). The OCP provides a measure of organizational values whilst the OCI focuses on behavioural norms and expectations. According to Rousseau's (1990a) model of culture, organizational values and behavioural norms are distinct elements of culture (refer to Figure 1.2).

The OCP employs a Q-sort method to measure organizational values. It consists of 54 value statements (e.g. flexibility, stability, action-orientation, confronting conflict directly) derived from research on organizational values and culture⁴. The 54 values are sorted into 9 categories using the Q-sort technique from least to most characteristic to yield an overall profile of an organization's values. The OCP is also used to provide a measure of person-organization fit by comparing an individual's ideal organizational profile with his or her own organization's profile. Unlike the OCP, the OCI employs Likert scales to identify the behavioural norms and expectations that facilitate fitting into an organization. The inventory produces 12 basic subscales that reflect two underlying dimensions: (i) task versus people; and (ii) security versus satisfaction (Rousseau, 1990a). A more detailed outline of the properties of the OCI is presented in Chapter 5 (section 5.2.2).

Combined Methods

There would seem to be clear advantages to using an approach that combines quantitative and qualitative techniques to assess organizational culture, since in many ways, the two research methods are complementary (Cooke and Rousseau, 1988). For instance, while not all elements of culture are amenable to quantitative assessment, quantitative methods are advantageous for: (i) assessing observable elements of culture; (ii) facilitating cultural comparisons across organizations; (iii) exploring patterns of behaviour; and (iv) exploring the relationship between culture and organizational outcomes (eg., the relationship between culture and organizational success).

Qualitative research techniques such as interviews with key informants and participant observation, on the other hand, facilitate the exploration of an organization's underlying assumptions or deeper elements of culture. According to Schein, "working with motivated

⁴ Refer to Chatman (1991) for additional information on the development and properties of the OCP.

insiders is essential because only they can bring to the surface their own underlying assumptions and articulate how they basically perceive the world around them” (1990: p. 112).

As Rousseau (1990a) suggests, ideally, in order to maximise our understanding of the concept of culture as a social construction, we need to utilise a multi-method approach that incorporates both qualitative and quantitative research methods, “the logical next step” (p. 186).

1.1.5 Person-Culture Fit

The notion of person-organization fit is based on the idea that organizations have cultures that are better suited to certain types of people (Schneider, 1987; Caldwell and O’Reilly, 1990; Wilkins and Ouchi, 1983; O’Reilly, Chatman and Caldwell, 1991). In particular, organizations direct considerable resources to maximising ‘good fit’ between people and positions (Chatman, 1989). Numerous ‘good fit’ theories based on the interactional psychology perspective have emerged in terms of people’s careers (Holland, 1985), career success (Judge, Cable, Boudreau and Bretz, 1995), job choice (Hackman and Oldham, 1980; Cable and Judge, 1996), job satisfaction and commitment (O’Reilly et al., 1991) and organizational climate (Joyce and Slocum, 1984).

Although culture researchers may disagree about the best method for assessing culture, they do agree that culture plays an important role in determining how well an individual will fit into an organizational context (Rousseau, 1990a; Chatman, 1991). In particular, past research has shown that when an individual’s values match the values of a particular organization, they will have higher job satisfaction and will be more likely to maintain an association with the organization (Meir and Hasson, 1982; Chatman 1991; O’Reilly et al., 1991). In contrast, when people do not fit into an organization they are more likely to experience feelings of incompetence and anxiety (Chatman, 1991).

The proposition that people make job choice decisions based on person-organization (P-O) fit comprises the attraction component of Schneider’s (1987) Attraction-Selection-Attrition (ASA) model. According to Schneider (1987), individuals are attracted to organizations they perceive as having values like their own. Organizations in turn, select recruits who share their values, and new recruits who don’t fit will leave voluntarily or

involuntarily. In this regard, Schneider argues that “if people are differentially attracted to certain settings, differentially selected by settings, and differentially leave settings, then those who remain will look very similar indeed. They will have relatively similar interests, values, competencies and behaviours” (p. 356).

Values are a fundamental part of most definitions of organizational culture and they are an important aspect of individuals and organizations that can be directly compared (Cable and Judge, 1996). Values are defined as intrinsic, enduring beliefs about what is right or wrong (Rokeach, 1973), and organizational values are considered a group product (Schein, 1985; Chatman, 1991). Past research suggests that organizational value systems form the basis of appropriate member behaviour, and although all members of a group may not hold the same values, a majority of group members are usually aware of a given value or set of values, so that a central organizational value system exists (Chatman, 1991). According to Chatman (1991), while organizational selection procedures may be used to assess job related characteristics such as job skills, personal abilities, intelligence, and past work experience, because these are considered to lead to desirable job outcomes for the organization and the individual, selection procedures may also be used to select individuals whose value systems are seen as compatible with the organizational values, with individuals whose values appear incompatible being screened-out.

Interestingly, past research has shown that selection procedures typically focus on non-related job criteria, including attractiveness (Dipboye, Arvey, and Terpstra, cited in Chatman 1991), goal orientation and enthusiasm for the organization. Furthermore, despite the fact that the use of face-to-face interviewing has been shown to have low predictive validity (Avrey and Campion, cited by Chatman, 1991), face-to-face interviews continue to be used and the members of interview panels are trained to select individuals on the basis of ability or predicted performance (Rynes and Boudreau, 1986). According to Chatman (1991), “rather than focusing on job-related criteria, selection appears to be based on such socially based criteria, including ‘personal chemistry’, values, and personality traits and, possibly on how closely recruits’ preferences match organizational values” (p. 461).

O’Reilly, Chatman and Caldwell (1991) assert that the importance of values in organizational culture can be linked to the psychological process of identify formation; that

individuals seek a social identity that provides meaning and correctness and, in discriminating between in-groups and out-groups, they are attracted to those seen as similar to themselves. O'Reilly's research suggests that in the same way that similar backgrounds, attitudes and experience increases liking between individuals (Tsui and O'Reilly, 1989) organizations that reward certain behaviours and outcomes are attractive to different types of people. Furthermore, past research supports the proposition that job seekers are affected by congruence between their personalities and an organization's attributes (Tom, 1971; Cable and Judge, 1994; Judge and Bretz, 1992), and that people select environments that fulfil their needs, a process leading to the concept of person-organizational fit.

Person-organization fit is defined as the congruence between the values of an organization and the values of an individual (Chatman, 1991; O'Reilly et al., 1991). Although many aspects of an individual and an organization affect behaviour, person-organization fit is considered a meaningful though less researched way of assessing an individual's compatibility with a given organizational context (O'Reilly et al., 1991; Chatman, 1991). Past research has shown that congruence between the values of new recruits and those of an organization leads to positive outcomes for the organization and the individuals. In particular, research has shown that recruits whose values closely match those of the organization at entry, generally adjust to the organization more quickly, feel more satisfied and intend to remain, and actually remain with the organization longer (Chatman, 1991). These outcomes are therefore considered indicators of higher person-organization fit (O'Reilly et al., 1991; Chatman, 1991; Cable and Judge, 1996).

One way to assess person-organization fit quantitatively is to identify the values that are important to individuals and central to organizations. Consistent with an interactional psychology perspective, Chatman (1989, 1991) developed a model of person-organization fit that incorporates elements of both individuals and organizations. The model conceptualises fit in terms of the similarity between individual and organizational values and draws on the Q-sort method, a nomothetic and idiographic measure, to establish the level of congruence between individual and organizational values. Chatman's model is interactional and considers both the effects that people have on organizations and the effects that organizations have on people (Chatman, 1989). Consistent with this model, researchers developed the Organizational Culture Profile (OCP; O'Reilly, Chatman and

Caldwell, 1991) to investigate person-organization fit using the Q-sort procedure. The OCP contains a set of value statements that are used to assess the extent to which the values characterise a given organization and an individual's preference for that particular configuration of values. Past research has indicated that the OCP dimensions generalize to a large set of heterogeneous organizations and are applicable across organizations (Chatman and Jehn, 1994).

While past research has identified the culture of some isolated organizations (eg., Rousseau's research (1989, 1990b) on US aircraft carrier deck operations) there has been relatively little research on person-culture fit within the context of isolated and confined organizations in extreme environments (eg., polar, undersea and space habitats). Research investigating the implications of person-culture fit within the context of groups in such settings constitutes an important area of development given: (i) the importance of effective selecting, recruiting and training of personnel required to live in such settings for extended periods of time with limited or no opportunity to leave; (ii) the social and economic cost of poor selection choices in terms of individual and group productivity and even group survival; and (iii) the fact that organizational theories derived from data collected in corporate and business settings may not be applicable to organizations in isolated, confined and extreme environmental settings.

Antarctica represents an ideal environmental setting for such research and has long been considered an analogue to other extreme environments, including undersea and outer space habitats (Palinkas, 1990; Ursin, 1991; Suedfeld and Weiss, 2000). Certain features of the Antarctic environment approximate the physical environment of other isolated and extreme environments, and the social composition of Antarctic stations resembles the composition of teams in other extreme environments, including undersea and spaceflight missions. In particular, the features of Antarctic station life with similarities to extended missions in space include: the composition of the personnel; the nature of the work (science, exploration, and support); heterogeneous crews; high level of skills; and the rotational structure of tours of duty (Palinkas, 1990).

This thesis presents the results of a series of investigations on the culture of Australian Antarctic stations. It presents a historical case study of Australian Antarctic station life and culture from 1950 to 1999 exploring: (i) the use of qualitative and quantitative

research methods for assessing Antarctic station culture; (ii) the impact of perceptions of Antarctic station culture on individual attitudes and job outcomes; and (iii) the implications of 'good fit' into Antarctic station life and culture. Before presenting the findings of this thesis, however, background information on the Antarctic, Australian National Antarctic Research Expeditions (ANARE), and Antarctic station life will be presented, and relevant literature will be reviewed.

1.2 Antarctica

1.2.1 Background

Antarctica was the seventh and last continent on earth to be discovered. Geographically, it is the southern extremity of the world, thirteen and a half million square kilometres, twice the size of Australia and about ninety-eight percent of it is permanently covered in snow and ice. Antarctica is the coldest, driest, windiest and highest continent on earth; it has the lowest recorded temperature (-89.6 ° C); it receives only slightly more water from the atmosphere than the Sahara desert and yet it holds much more water than all other continents combined; its winds reach more than 120 kilometres an hour (with maximum gusts more than 250 kilometres per hour); and it has an average elevation of 2,300 metres.

The Antarctic continent has no permanent human inhabitants, though around 1000 people of different nationalities live and work on the continent for up to 12 months at a time. These sojourners are spread across numerous Antarctic research stations located on the Antarctic continent and the sub-Antarctic islands. Antarctic seas and coastal areas have a rich abundance of plants and animals, including seals, birds and penguins which breed on Antarctic shores. However, land mammals, reptiles, amphibians and trees are noticeably absent from the Antarctic environment and climatic conditions are much more severe than in the Arctic where life, including land mammals, are far more abundant.

Politically, a unique international agreement was achieved at the height of the cold war leading to the establishment of the Antarctic Treaty in 1959. The 12 signatories to the Treaty (Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the United Kingdom, the Soviet Union and the United States of America) recognised that the Antarctic should be reserved for peaceful purposes and declared the area south of 60° S an international preserve for scientific study. The signatories have established environmental protection for the Antarctic environment, including coastal and sea plants and animals, the

protection of special areas of environmental research and historical importance, and effective waste management. In 1991, the Madrid Protocol on Environmental Protection was appended to the Antarctic Treaty, which now has 29 signatories. The Treaty commits members to preserving Antarctica as “a natural reserve, devoted to peace and science”, and forbids “any activity relating to mineral resources” including mining. Australia has the largest national claim of Antarctic territory; approximately 6 million square kilometres, or 42.8 % of the entire continent.

1.2.2 History

The First Explorers

Whale and seal hunting interests and the pursuit of national glory through exploration of the South Magnetic Pole motivated early expeditions to the Antarctic. The earliest recorded exploratory expeditions to the Antarctic were: (i) the 1819 Russian expedition led by Bellingshausen which claimed the discovery of two islands and is thought to have been the first sighting of the Antarctic continent; (ii) the 1837 French expedition under Dumont d’Urville which claimed the discovery of the coast of Terre Adélie (Antarctic territory); (iii) the American expedition of 1838 under Wilkes which reported sightings of the continent; and (iv) the 1839 British expedition under Ross which found and named the Ross sea. All three Antarctic expeditions called through Sydney, Australia, before sailing south (Jacka and Jacka, 1988).

The Royal Society of Victoria established the first Australian Antarctic Exploratory Committee in 1866 and records show that Australians, in particular, were actively involved in expeditions from the nineteenth century. In 1889 Carstens Borchgrevink, a Norwegian-born Australian resident, travelled to the continent. Borchgrevink became the first person to walk onto the continent and his expedition became the first to winter in the Antarctic. Numerous Australian scientists participated in expeditions in the next few years, including the Tasmanian-born physicist Louis Bernacchi and Australian scientists T. W. Edgeworth David and his student of the time, Douglas Mawson, who accompanied Robert Scott on his first Antarctic expedition in 1901. This expedition became the first to climb Mount Erebus, and the first to reach the South Magnetic Pole.⁵

⁵Refer to Jacka and Jacka (eds) Mawson’s Antarctic Diaries, Allen and Unwin, 1988, for an extensive account of they early exploratory expeditions.

Douglas Mawson's famous exploratory and scientific voyages of 1911-14⁶ and the 1929-31 British Australian and New Zealand Research Expeditions (BANZARE), formed the basis of early Antarctic history and subsequent Australian Antarctic territorial claims. The Australian Antarctic Expedition of 1911-14 covered several thousand kilometres of Antarctic sledge journeys, and the two BANZARE expeditions led to the mapping of more than 3,000 kilometres of Australian Antarctic Territory coastline.

The achievements of the early Australian Antarctic Expeditions and Mawson's own active lobbying to the Australian Commonwealth Government for Australian Antarctic Territory, paved the way for ongoing Australian Antarctic research, exploration and mapping of the continent and, in 1947, led to the establishment of Australian National Antarctic Research Expeditions and the four permanent Australian Antarctic stations.

1.2.3 Australian National Antarctic Research Expeditions

The Australian National Antarctic Research Expeditions (ANARE) organization was established in 1947 and in the same year, the first Australian Antarctic stations were established on Heard and Macquarie Islands. Since its establishment, the principal focus of ANARE has been the conduct of scientific research. In 1948 the Australian Antarctic Division (AAD) was established to administer ANARE and today, the AAD continues to provide logistic and operational support for expeditions and supports scientific programmes in the Australian Antarctic and sub-Antarctic territory.

The AAD forms part of the Australian Commonwealth Department of the Environment, Sport and Territories (DEST) and operates under Commonwealth Government legislation. The AAD organizations that have links with ANARE include the Bureau of Meteorology, the Australian Geological Survey Organization, the Australian Surveying and Land Information Group, the Tasmanian Parks and Wildlife Service, the Ionospheric Prediction Service, the Commonwealth Scientific and Industrial Research Organization (CSIRO), the Department of Defence and Asset Services, some Australian Universities, and the United States National Aeronautics and Space Administration (NASA).

⁶For Mawson's full account of this expedition, refer to D. Mawson's The Home of the Blizzard: The story of the Antarctic Expedition, 1911-14 Home, Hodde and Stoughton Ltd, London 1930.

There are four permanent Australian Antarctic and sub-Antarctica stations: (i) Mawson, the first permanent Australian Antarctic station established in 1954 outside Horseshoe Harbour 5,463 kilometres south-west of Hobart in the western part of the Australian Antarctic Territory; (ii) Davis, established in 1957 in the Vestfold Hills 4,826 kilometres south-west of Hobart; (iii) Casey⁷, established in 1969, 3,430 kilometres south of Hobart; and (iv) Macquarie Island, the site of Australia's first scientific research station established by Mawson's Australian Antarctic Expeditions in 1911. Since 1825, Macquarie Island has been administratively part of the Australian State of Tasmania.

The original station buildings were small structures constructed from lightweight material transported to the Antarctic by ship and erected in minimal time by expeditioners. Over time, however, these buildings deteriorated and in 1981 the Australian Government approved a re-building program to construct entirely new accommodation on the three continental stations. The re-building program commenced in the early 1980s and by the mid 1990s, all three Antarctic stations had been completely reconstructed using modular units shipped to the Antarctic from Australia. The new buildings are assembled on concrete foundations secured to the ground by ground anchors, and steel frames that support 150 millimetres thick steel panels filled with fire resistant polystyrene foam. They have a fifty-year life span that can be extended with the replacement of the outer panels, which are finished in external bright colours designed to contrast with the white Antarctic snow and ice to make the buildings more visible in blizzards (Haywood, 1997).

Unlike the original station buildings, the new accommodation offers expeditioners air-conditioned comfort, privacy, and access to modern communication facilities. The accommodation includes private single bedrooms, a lounge, small theatre, library, bar, kitchen, dining rooms and a medical surgery. Two hundred and forty volt power is produced from diesel generators to power equipment and appliances, and excess heat produced by the engines heats water that is piped through the buildings, providing stations with hot water. The diesel engines use diesel oil stored in large steel containers that are encased in retaining walls. Water for cooking and washing is either supplied by a heat bell immersed in the ice (at Casey and Mawson), by reverse osmosis and a snow melter (at Davis), or piped directly from a fresh water gully on Macquarie Island (Haywood, 1997).

⁷Casey station is the closest Australian Antarctic station to mainland Australia. Casey is built on the site of Wilkes base, the original American Antarctic base built by the United States Government in 1957 for the International Geophysical Year.

On all Australian Antarctic stations wastewater and sewage receives secondary treatment in a waste management plant, with the clean effluent discharged out to the sea. Rubbish (non-sewerage) is transported back to Australia.⁸

In addition to the physical changes to stations brought about by the re-building program, technological and communication developments between the 1980s and the early 1990s dramatically impacted upon Antarctic station life. Today, whilst expeditioners still remain physically isolated from their families and friends, telecommunications and computer facilities, including access to the Internet, provide expeditioners with important communication and social links with families, friends and colleagues in Australia and around the world.

While communication using the original radio system was unpredictable and often unavailable for those who participated in early expeditions, by the mid 1980s the development of the INMARSAT (shipping satellite system) linked ANARE stations with a communication facility that enabled phone calls and the electronic transmission of meteorological data. This system was superseded by the ANARESAT (INTELSAT satellite system) in the late 1980s, and by the early 1990s, expeditioners could make telephone calls to Australia at STD (interstate telephone) rates from their bedrooms. In addition, Facsimile, Internet and telephone access are now commonplace and the introduction of these communication and technological advances impacted on all aspects of station life, including decision making. Once the responsibility of each wintering station under the direction of its Officer in charge, today decision making concerning scientific programs, administrative, maintenance and safety issues is communicated to stations from the Australian Antarctic Division in Hobart, and meteorological data are directly accessed from Australia (Bowden, 1997):

It's almost like Big Brother. A lot of the science data collection is going back to Australia without any interference by the person (meteorological officer) on site. The supervisors (in Australia) have more direct control of what's going on in the station. The building maintenance people (in Australia) can plug in there and know what the temperature is in the recreation room and whether the water is too hot or cold, or the air temperature is the right mixture⁹.

⁸Refer to Bowden (1997) for additional information on the history of ANARE stations.

⁹Comment made by a communications consultant; refer to T. Bowden's *The Silence Calling*. Allen and Unwin, NSW, 1997, p. 393.

Until 1979, women were excluded from Australian Antarctic expeditions and today they are still under-represented, particularly in wintering expeditions where the ratio of women to men is around 1:8. The introduction of women expeditioners in the 1980s coincided with the station re-building program and resulted in an influx of construction workers from the Department of Housing and Construction, who participated in summer and winter expeditions throughout the 1980s and early 1990s. According to Bowden (1997), during this period the construction workers “weighted the population towards the ‘tradie side of the equation - and further confirmed the ‘blokey’ elements of traditional ANARE culture’ (p. 447).

1.2.4 Women and ANARE

The discovery of the Antarctic began with the discovery of the sub-Antarctic islands and the first women who went to the sub-Antarctic islands were either the wives of whaling captains or “convict” women who took up with sea captains to get away from the drudgery of colony life (Chipman, 1986):

Certainly women were on board some of these far-searching vessels, for their names are known. Certain it is, also, that many more women ventured south than those whose names have been recorded. The captains and ships’ officers of whaling vessels sometimes were accompanied by women and men sent to the islands for months at a time, and sometimes for a few years, to work at the killing of seals and allied trades, often took women with them...Often they (women) were given only passing reference, and rarely were their names recorded. Even today.. the names of women who worked aboard modern Russian whaling vessels.. are not known. In the early days, women were far fewer in number than men...The same is true today. (p. 12)

Although women had contact with the Antarctic and sub-Antarctic islands as early as the late 18th century, records suggest that it was not until the twentieth century that women actually stepped onto the Antarctic continent. Their acceptance as workers in the region is a fairly recent development.

The Norwegians were very active in whaling in the Antarctic in the early 1900s. Records indicate that the ship owner of one of the biggest Norwegian firms, Lars Christiansen took his wife south for voyages, beginning with his first expedition to the Antarctic in 1931 and two following expeditions in 1932 and 1933 (Chipman, 1986). The Christiansens had as their guests two other women and although these women became the first women on record to sight the Antarctic continent, there is no record of them actually stepping ashore.

In 1934, Klarius Mikkelsen, a veteran of many Antarctic expeditions with Christiansen ships, captained the fourth Christiansen expedition to the Antarctic. Mikkelsen was accompanied by his wife Caroline Mikkelsen who in February 1935, became the first woman (officially) to step ashore in the Antarctic in an area not far from the site of the Australian Davis station (Chipman, 1986).

It wasn't until 1947 that women actually wintered on the Antarctic. In that year, two American women, Edith Ronne, the wife of the Ronne Antarctic expedition Captain Finne Ronne, and Jenny Darlington, wife of the one of the expedition's pilots, spent the winter with their husbands on the Antarctic peninsula. With the exception of Edith Ronne and Jenny Darlington, however, women played no official part in the exploration of the Antarctic. It was not until 1974 that women actually wintered in the Antarctic as scientists in their own right. In that year, Dr Irene Peden, an Associate Professor of Engineering, received a grant with the Polar Upper Atmospheric Program at the US National Science Foundation and became the first woman to work in the Antarctic interior. In the same year, two biologists, Mary Odile Cahoon and Mary Alice McWhinnie became the first women to winter in the Antarctic at the American McMurdo Station (Rothblum et al., 1998).

Although ANARE was officially established in 1947, it was not until the summer of 1959-60 that four Australian women were allowed to spend five days on Macquarie island carrying out research. The women were: Isobel Bennett, a marine biologist; Mary Gillham, a botanist; Susan Ingham, a biological secretary; and Hope Macpherson, an ecologist. In an interview for the documentary *Women Down South* (R. Bowden, 1987), two of the women made the following comments:

For some years I had been receiving material collected by the men that went down, so I had quite a lot to do with the Australian Antarctic Division (AAD). They knew I was interested to see the localities where the material came from and I was promised that if the time ever came when they would allow women to go down on the ships, that I would be one of the one's to go (Hope McPherson).

There was a briefing for all the personnel who were going down, they had to undergo quite a lot - the people who were going to be there for the whole year. We (women) had attended a couple of those meetings and then we had a 'final' from Mr Law himself (the AAD Director at the time) and we weren't very amused with his final remark to us which said '**on our behaviour depended the future of women in the Antarctic!**' We were really quite indignant about it, but silence was the best answer to him I think"...The first year...we had no problems of any kind.... The second year we went down (1960/61) the officer in charge of the expedition flatly refused to let us sleep ashore! It was quite stupid really because we had

to wait until the first duck (sea bird) went ashore and we had to wait until five O'clock when the last duck (sea bird) left, so this meant we lost hours and hours of daylight because it was light at three O'clock in the morning and the low tides were very early in the morning. By not being ashore and able to get straight on with our work we lost hours of time... (Isabel Bennett).

Another of the first women from the AAD to spend a summer in the Antarctic mainland made the following comment (ABC documentary *Women Down South* conducted by R. Bowden (1987):

I first went down to Macquarie Island in 1968 (summer) but the Antarctic mainland was just about forbidden for women and we had to put up a bit of a fight (to get there)....I really tried hard...I applied year after year after year because it was really in the range of my duties to look after the photography in the Antarctic..... Year after year I wasn't even given an answer and when I asked what happened to my application...I was just laughed at.. they said "women just can't go there, its just too harsh and too hard" and "no berth", and if they really went into detail they just said that there were no toilets...funny enough when we finally went there were still no toilets, except for men's of course.... I might add we couldn't even go to the training camp for the Antarctic. They had a training camp in the Victorian Alps and for years and years and years women were not allowed to go for the same reason: "they had no toilets".

It was a privilege to go because everybody wanted to go on trips, everybody applied but applying meant you had to put down a program - one wasn't just sent for fun even though one did enjoy the trip. Then there was the big time of waiting, then there were rumours and sometimes there was blood on the floor (laughs) about who was going and who wasn't, particularly when women first started to go to the Antarctic mainland - there was a lot of jealousy, actually, amongst some men, they just didn't want us to go and there was a lot said.

In the late 1970s, the sub-Antarctic station on Macquarie Island, which has the longest history of involvement with Australian women scientists both as "summerers" and "winterers"¹⁰, was the station at which women were first sent as ANARE expeditioners. In 1976 Dr Zoe Gardner became the first woman to winter with ANARE at Macquarie Island. She was recruited as the medical officer to an expedition of 18 men and it was a shortage in male doctors willing to serve on Antarctic stations at that time, that led to her appointment. Without a doctor the station would have to be closed and the AAD had the option of either appointing a woman or closing the station down.

It was not until 1981, that Dr Louise Holliday was appointed as the medical officer at Casey station, becoming the first woman to winter on the Antarctic mainland.

¹⁰ Expeditioners who live and work on a station for up to 3 months over summer only, are commonly referred to as "summerers", whilst those who live and work on a station between 12 and 15 continuous months, including an Antarctic winter are commonly referred to as "winterers".

Interestingly, Dr Holliday later commented that she felt the 24 men stationed with her in 1981 would have preferred an all-male station (Chipman, 1986). Dr Holliday's appointment, however, signalled the beginning of mixed ANARE expeditions and an end to the all-male era of ANARE (Chipman, 1986).

The all-male station environment encountered by the first women to participate in ANARE had existed for well over 30 years, when the majority of non-scientific personnel were ex-servicemen under the command of an officer in charge. Phillip Law, the first Director of ANARE and the AAD, made the following comments in relation to the recruitment of ex-servicemen in expeditions prior to the 1980s (Bowden, 1997):

They (ex-servicemen) brought with them maturity and service attitudes to discipline and conformity and then, on the other hand, a certain amount of male boisterousness, rough language, horseplay and a propensity for hard drinking when opportunities offered. In contrast was the behaviour of the unworldly young scientists, fresh from prolonged adolescence of undergraduate life. They (the scientists) were treated initially, in most cases, with amused contempt or outright intolerance, to which they tended to respond with intellectual arrogance (p. 454).

In 1983, Peta Kelsey, a geophysicist, was the first woman scientist to participate in an ANARE winter expedition and, in the same year, Pene Greet, an upper atmospheric physicist, was the first woman to winter on the Australian Antarctic territory in a non-medical position. It was not until 1989, however, that Diana Patterson became the first woman station leader on the Antarctic continent. Diana Patterson had applied for the position nine years earlier but was informed that although she was welcome as a cook or radio operator, her application for the station leader position was unsuccessful. Earlier in the same year, Alison Clifton was appointed station leader at Macquarie Island, making her the first ANARE women station leader and in the following year, Joan Russell was appointed station leader at Casey.

The expedition at Casey in 1990 marked the year in which sexually explicit photographs of women were permanently removed from living quarters and workshops following complaints from women expeditioners. It also marked the year in which the third page of the station newspaper, which regularly included a sexually explicit photograph of a woman became a point of controversy following complaints that the newspaper 'had a repetitious

sexist outlook'. A women upper atmospheric physicist wintering at Mawson that year made the following comments:

Suddenly one day in mid-June, there were full genital pornographic pictures in this newspaper...you're faced with this stuff at breakfast. And I wrote up a probably fairly nasty comment on the board, saying: 'would the fucking MCPs who put together the fucking newspaper please distribute their pornography more discreetly' (Bowden, 1997, p. 463).

In August 1993 a conference entitled: *Living in Antarctica: Women in a Man's world?* was held in Hobart and among its aims was the identification and analysis of gender management issues¹¹. The conference highlighted a number of gender management issues, including: (i) that the participation of women in wintering expeditions on Australian and international Antarctic stations, was less than 10%; (ii) even fewer women were in positions of leadership; (iii) within the context of ANARE, issues surrounding the introduction of women to wintering expeditions, and the management of mixed gender expeditions had not been properly addressed or resolved; and (iv) the notion that 'Living in Antarctica - Women in a Man's World' was an outdated construct that was no longer relevant (Edwards and Graham, 1994, p. 3). Three conference workshops produced a set of recommendations to address Equal Employment Opportunities (EEO) and gender problems in ANARE recruitment, selection, pre-embarkation training, expeditioner assessment and responsibility, sexual harassment reporting and handling, and sanctions. In addition, the conference identified a need for more social science research programs, focusing on "group dynamics" and "individual and group psychology" (Edwards and Graham, 1994). A copy of the conference aims are presented in Appendix A1 and other EEO conference recommendations are presented in Appendix A2.

1.2.5 Australian Antarctic Stations

An ANARE wintering expedition typically consists of a station leader, a chef, a medical practitioner, scientists (mainly physicists and biologists), support staff (trades and communications personnel) and technical personnel from the Australian Bureau of meteorology. Although prior to 1979, expeditions to the Antarctic continent had an all-male contingent, the majority of expeditioners to ANARE over the last 20 years are still men, and the ratio of women to men is around 1:8.

¹¹K. Edwards and R. Graham (eds) Gender on Ice: Proceedings of a conference on women in Antarctica. Australian Government Publishing Service, 1994.

Whilst a typical wintering expedition comprises between 12 and 20 personnel, in summer the population of a station may increase to 70 or more with the addition of scientists and other support staff that arrive for summer research and logistics programmes. In summer, there are also round trip berths to the Antarctic for journalists, artists, photographers, writers and politicians (Haywood, 1997). Since the early days of ANARE station communities have consisted of three groups: (i) tradespersons - almost always men employed as diesel mechanics, carpenters, electricians, plumbers; (ii) scientists and researchers - usually biologists, physicists, glaciologists; and (iii) shift workers, including staff from the Bureau of Meteorology and communications officers. The members of the community that do not belong to one of these groups, include the station leader (officer in charge prior to the 1980s), medical practitioner and chef who are individual appointments and have no professional colleagues on stations.

Station teams are mixed on many other levels, including gender (male versus female), age (young graduates versus older tradesmen), those with indoor interests, including drinking versus those who prefer the outdoors ('Barflies' versus 'outdoor types'), 'those interested in pornographic movies versus those who prefer to do other things', 'those seeking casual sexual relationships versus those who are not', and those with an a 'macho heroic' perception of Antarctic station life versus those who are more interested in experiencing and exploring the Antarctica environment (Williams 1993, p. 85). Although collectively all Australian and International Antarctic stations provide for a diverse cultural mix with over 12 cultural groups represented, the overwhelming majority of expeditioners on Australian stations are white Anglo-Saxon men.

With only three ships arriving each year, leaving an Antarctic station is usually not possible after the last ship departs at the end of summer. Following the departure of the last ship, expeditioners wintering on Antarctic stations remain physically isolated for around six months and are required to live and work on a station for about 12 months or more before returning to Australia. On average, around 40% of expeditioners arriving on stations have wintered in Antarctica before, and the maximum number of winters for a single expeditioner is reported to be around 10 (Haywood, 1997).

Antarctic expeditioners are on duty 24 hours a day, though working hours vary according to occupation. For instance, whilst the working hours of trade and technical staff resemble

an ordinary roster, with most beginning work at about 8.00 am and finishing at around 5.00 pm, scientists often maintain experiments through the night and meteorological personnel keep a roster from early morning to late evening. Station personnel share station chores since there are no cleaners, dishwashers or garbage collectors. Everyone is required to perform other duties, including general kitchen chores, garbage clearance, water duties, communal cleaning, restocking and participation in field work, and on Sundays expeditioners take turns at cooking to enable the chef to have a day off regular duties (Haywood, 1997).

The AAD provides all ANARE expeditioners with pre-embarkation training in cold weather survival, fire fighting, community living and environmental management, and all expeditioners are supplied with official (cold weather) clothing, though, expeditioners are also required to take their own indoor clothing.

Salary packages for Antarctic personnel vary according to the type of work undertaken and are generally attractive because they include generous tax-free allowances. Whilst most expeditioners, including station leaders, medical practitioners, technical and trades personnel receive salary packages and extra allowances for remote living, community duties and extended hours, scientific personnel often work in a voluntary capacity and receive no special allowance for Antarctic station duties. Although most University based scientists obtain grant funding to undertake research in Antarctica, they are not awarded a salary package for their work in the Antarctic.

1.2.6 The Application and Selection Process

As highlighted in ANARE selection and recruitment information (available on the Internet), individuals interested in participating in ANARE expeditions (for all professional vacancies except Bureau of meteorological technicians and scientists) are invited to apply in writing and applicants are selected for interview on the basis of their written application. Job descriptions and information on the selection process and selection criteria can be accessed electronically from the Antarctic Division's World Wide Web site. The selection process consists of three stages. First, applications are assessed against the advertised selection criteria and those considered to "best meet the selection criteria" are short listed for interview. Second, applicants are interviewed by a Selection Advisory Committee to assess their "technical expertise and personal work qualities".

Third, applicants that are listed for further consideration are then required to complete a medical examination and an adaptability assessment. Information provided by the AAD on the three stages of the ANARE selection process appears in Appendix A3.

Psychological Assessment

In the early years of ANARE, expeditioners did not undergo any form of psychological assessment and were not screened for psychopathology. Expeditioners were selected by the head of the AAD through a process of networking. For instance, the men who participated in the first ANARE expedition in 1948 were selected directly by Stuart Campbell, the first Executive head of ANARE, using 'a combination of the old boys network and the belief that anyone selected to go would be the right type anyway' (Bowden, 1997, p. 217). In 1949, when Philip Law took over as head of ANARE and the AAD, a formal assessment procedure, which included Australia-wide advertising of positions and an interview, was introduced for the first time. However, clearly defined selection criteria and a formal selection process were still lacking, because Law, who never wintered in Antarctica himself, chaired all interview panels and acknowledged that he used his 'gut feeling' to select men for Antarctic expeditions:

I (Law) used to be impressed with enthusiasm ...the sort of man who would say, 'I will do any job...so long as you take me'. I thought that was a wonderful sign of enthusiasm. ...Antarctica is so isolated, so many things in life are removed from your environment (that really all you have down there is your job. If you don't like that job, or you're not good at it, your chance of success is heavily reduced. So the most important thing, I think, in picking an Antarctic person is that he should love his job, because he's got to be at it fourteen or sixteen hours a day for a whole year...If he's good at it then he gets the respect of other men, regardless of his personality, and that's a plus.¹²

As Bowden (1997) highlights, although on several occasions in the 1950s and 1960s ships were able to evacuate expeditioners from Macquarie island for urgent medical attention, the same was not possible for the stations on the continent, which are inaccessible during the winter due to excessive winds, low temperatures and surrounding ice and snow. However, the need for psychological screening of Antarctic expeditioners became apparent when in 1959 an expeditioner with major psychological problems at Wilkes station (original station at Casey) was placed in a make shift cell for six months because he was considered a life threat to his colleagues and could not be physically returned to Australia.

¹²T. Bowden The Silence Calling: Australians in Antarctica 1947-97. 1997, p. 217, Allen and Unwin, NSW.

In the following years psychological testing was introduced to ANARE expeditioner selection and the Australian Army Psychological Service was commissioned to undertake the development of psychological assessment for ANARE expeditions, a process that is continued today.

The ANARE Psychological assessment process includes a psychological interview undertaken by psychologists from the Australian Army Psych Corps (AAPsych Corps.). The interview focuses on a set of behavioural criteria developed by the AAPsych Corps. from policy decisions, and past Australian and US Antarctic research. The criteria for assessment are expressed in the 'negative to fit' with the philosophy of negative selection of the AAPsych Corps. designed to identify applicants at 'an unacceptable risk of one or more of the following essential four criteria':

1. not performing their job effectively; or
2. not coping with their period of service in the Antarctic; or
3. conducting themselves in a manner which will disrupt the harmonious working or social operation of the station community; or
4. not meeting any other particular requirements indicated by the AAD.

Within each criterion is a set of specific aspects for consideration and assessment to determine suitability. Information on the four core criteria and associated sub-criteria are publicly available on AAD's Web site and in recruitment information. The behavioural criteria are assessed and rated by the AAPsych Corps. psychologists during an applicant's psychological interview in stage three of the application and selection process. In addition to the interview, applicants are required to complete the 16 Personality Factors (16 PF) Inventory.

Although expeditioner selection criteria have been improved over the years and incidences of psychopathology are rare (Rothblum, 1990), ANARE selection and recruitment procedures are based on a 'negative fit' pathogenic approach (i.e. identifying and screening-out traits associated with maladjustment) emanating from the emphasis of past research on identifying individual characteristics associated with poor human adjustment and performance in the Antarctic (Steel et al., 1997). Importantly, however, the extent to which current selection and recruitment procedures should also be identifying applicants

with suitable social skills, proven experience in working with small mixed groups and knowledge of public sector practices (eg., Equal Employment Opportunity (EEO) legislation), needs to be considered.

The proceedings of the 1993 conference 'Women in Antarctica' identified a number of issues in relation to ANARE recruitment and selection that needed to be addressed consistent with Commonwealth legislation on anti-discrimination and Commonwealth EEO regulations. The conference was undertaken to provide recommendations for future Australian Antarctic expeditions on the management of men and women in the Antarctic. It generated a number of recommendations for achieving equal opportunity in ANARE recruitment and selection that need to be mentioned within the context of this research and are listed below. A more detailed list of the conference aims and objectives are presented in Appendix A1.

Conference recommendations for ANARE recruitment:

- “That all recruitment advertising material generated by and used by ANARE depict women and mixed groups accurately in terms of today’s station life.
- That returned women expeditioners be encouraged to participate in the ANARE recruitment program in order to model women’s involvement in the full range of occupations.
- That ANARE selection focus on positive expeditioner characteristics, requiring applicants to demonstrate a working knowledge of equity, fairness, good gender relations and operational health and safety on Australian Antarctic stations. That all selection panels, including those selecting tradespersons, include a woman” (Edwards and Graham, p. 115-116).

Conference recommendations for ANARE selection:

- “That areas of questioning rendered redundant by the Public Service Act and Commonwealth Anti-discrimination legislation be deleted from the ANARE psychological assessment.
- That drug and alcohol related behaviour problems be screened in the ANARE Psychological assessment process.
- In cases of sensitive grounds for appeal (eg., sexuality) a more private process of appeal be formulated and used within the ANARE selection process.” (Edwards and Graham, p. 115-116)

Recommendations relating to health and well being in Antarctica were also formulated at the conference and included the following:

- “that station leaders should have some involvement in the selection process of their wintering groups.
- that the Antarctic Division review their experience in the minimal number of people of the same sex on a station in order to assess whether guidelines should be set.” (Edwards and Graham, p. 119)

The above recommendations highlight the existence of a number of perceived problems in ANARE selection and recruitment, including the under-representation of women in expeditions and selection panels, and social problems on stations associated with alcoholism and gender discrimination. Although EEO initiatives in DEST include “ensuring that selection committees include women and other EEO group members¹³ or appropriately trained staff where identified group members are amongst the applicants”, the extent to which the AAD has implemented these recommendations within ANARE is unclear. Furthermore, the fact that the above recommendations were formulated and forwarded to the AAD, highlights the perception of many, that social and gender-based conflict exists on stations and that

¹³ EEO target groups' comprise women, Aboriginals and Torres Strait Islanders, people of non-English speaking backgrounds, and people with any restriction or impairment.

changes to ANARE culture and ANARE selection and recruitment procedures need to be considered. Refer to Appendix A2 for other EEO recommendations made at the Conference.

1.2.7 ANARE research

An Australian scientist interested in carrying out research in Antarctica needs to submit a research proposal to the AAD demonstrating that the research is consistent with the Australian Government's Antarctic Science Program. The Government's key goals for the Antarctic program¹⁴ are:

- maintenance of the Antarctic Treaty system and Australia's influence in the system;
- understanding global climate change;
- undertaking scientific work of practical importance; and
- protection of the Antarctic environment.

In the 1992 report *Antarctic Science - The Way Forward*, the Antarctic Science Advisory Committee (ASAC) recommended that Australia's Science program be directed on the basis of long term strategic plans and that research should be organised within six 'core discipline areas, comprising: Atmospheric Sciences, Biological Sciences, Geosciences, Glaciology, Human Impacts and Oceanography. In addition, there is an eighth discipline area labelled 'non-core research'. The AAD is directly responsible for the Biological Sciences, Glaciology, Human Impacts research and 'non-core research'. The Bureau of Meteorology is responsible for Atmospheric Sciences, the Australian Geological Survey Organization is responsible for Glaciology, and the Commonwealth Scientific and Industrial research Organization (CSIRO).

Social and psychological research is regarded as a low priority research area within the Australian Antarctic research program, classified as 'non-core research' under the category of Human Biology and Medicine. It is classified in this manner because it is perceived as research that 'does not focus strongly on the major priorities defined by ASAC and should therefore be undertaken at 'negligible or relatively low cost to the overall logistic infrastructure' (ANARE Science Strategic Plans 1995-2000, p. 95). Given that the AAD decides if social and psychological research proposals are to be supported, whilst it actively conducts research of its own under the umbrella of Human Biology and Medicine, the extent to which independent research proposals with a social or psychological focus

can really be fairly reviewed and supported is questionable. This conflict of interest, coupled with the low priority status assigned to social and psychological research within the Australian Antarctic Research Programme, clearly restricts developments in social and psychological research and, in the long term, any potential benefits of such research to expeditioner selection and recruitment procedures. This issue is not restricted to the Australian Antarctic research program, as Suedfeld and Weiss (2000) assert:

Exacerbating most nations' generally unequal distribution of research support between the natural sciences and the behavioural social sciences (again, both in space and in Antarctic programs), this conflict of interests hampers psychologists in obtaining funds, facilities, and permission for conducting basic research (p. 10).

Approved ASAC Human Biology and Medicine research proposals rarely include psychological investigations, and projects in this area are generally undertaken by the AAD itself. A copy of Approved ASAC Projects for the 1999/00 season in this non-core research program area can be found in Appendix A4.

Psychological Research in the Antarctic

In her review of psychological research in the Antarctic, Rothblum (1990) highlights that women in the Antarctic are a minority and, apart from studies that happened to include women present on stations at the time of the research, there has been very little research on women in the Antarctic.

Research on women in the Antarctic is limited to a historical account of women in the Antarctic undertaken by Rothblum, Morris, Weinstock (1995, 1998), and a few North American studies which have identified many issues of interest, but are restricted due to small sample sizes (e.g. Kahn and Leon, 1994). Australian research on women in the Antarctic comprises Elizabeth Chipman's historical account of the first women expeditioners (1986), a chapter of Tim Bowden's historical account of ANARE (1997), a study of the pursuits of women scientists (Burns, 1996) and a second more recent historical and personal account of women in ANARE (Burns, 2001). Although historical and personal accounts of expeditioners' experiences are important and make a valuable contribution to Antarctic research, there is a need for more scientific research, including studies designed to explore social aspects of Antarctic station life and culture (Rothblum, 1980).

¹⁴The key goals are listed in the ANARE Science Strategic Plans 1995-2000.

As a discipline, Psychology has occupied a non-research position in polar science; understanding the impact of the Antarctic environment on individuals is perceived to be secondary to the “real” goals of expeditions. This issue has been addressed in previous research. For instance, Suedfeld (1991) asserts that whilst polar research in the natural sciences continues to flourish, behavioural research is not considered legitimate scientific research within the context of Antarctica. However, despite this, some psychological research has been undertaken in the Antarctic of which some is selection-oriented and some exploratory.

Early psychological studies in Antarctica focused on symptoms of maladjustment and poor coping and were based on the premise that prolonged exposure to the physical Antarctic environment resulted in adverse psychological and physiological symptoms. Symptoms of physical or psychological distress identified include: insomnia, irritability, headaches, sleep disturbance, boredom, fatigue, anxiety, depression, loneliness, reduced motivation, increased appetite, digestive problems, rheumatic pain and “increased sensitivity to physical and social stimuli” (Palinkas, 1989, p. 236). Gunderson (1968) reported that incidences of psychiatric hospitalisation among U.S. navy personnel were three times higher if they had undertaken service in the Antarctic, whilst Hagar (1964) found that men usually could not adapt to extreme or extended isolation without displaying psychological problems. Research by Strange and Youngman (1971) identified isolation, boredom and lack of usual sources of satisfaction as the main stressors of the Antarctic environment. Strange and Klein (1974) and then Palinkas (1989) referred to the “winter-over syndrome” with symptoms of depression, problems of hostility, sleep disturbance and impaired cognition. For instance according to Palinkas (1992), during the 1989 Antarctic winter at the American Antarctic base at McMurdo, 64.1% of winterers reported sleep disturbance; 62% reported feeling depressed; 47.6 % reported feeling more irritable than usual; and 51% experienced concentration or memory problems (p 654). Similar symptoms of maladjustment continue to be described in more recent literature (Palinkas, Suedfeld and Steel, 1995; Palinkas and Browner, 1995; Palinkas, Johnson, Boster and Houseal, 1998), though symptoms relating to the “winter-over syndrome” are now increasingly referred to as temporary physiological changes that have no long term effects (Suedfeld, 2000).

Another common theme in Antarctic psychological literature is the relationship between individual personality traits and psychological adjustment to Antarctic station life. According to Biersner and Hogan (1984), adjustment to Antarctic station life is a function of narrow interests and a low need for social stimulation. These authors suggest that extraverts and individuals with many hobbies and interests are less successful at adapting and generally perform more poorly than the more quiet, independent and retiring types (Gunderson and Nelson, 1965; Strange and Youngman, 1971). Palmai (1963) reported that “educated isolates”, or educated, independent and introverted personnel score higher on performance evaluations and report sick less often than the more extraverted, group dependent personnel. According to Natani and Shurley, (1974) “isolates may thus individually and as a group establish internal routines and external expectations that seem idiosyncratic and immature to an outsider but are extremely important to the station party for structuring time, maintaining self-identity, and providing social security” (p. 110). In contrast, some recent research suggests that better adjustment is associated with low scores on depression and divergent thinking, and high scores on cheerfulness, trust and caution (Biersner and Hogan, 1984). Contrary to some past research (eg., Gunderson and Nelson, 1965; Strange and Youngman, 1971; Palmai 1963), more recent research undertaken by Steel, Suedfeld, Peri and Palinkas (1997) found that Antarctic expeditioners are generally more extraverted, open, agreeable and conscientious than normative controls. This research also found that characteristics such as age, occupational experience, and marital history were unrelated to adjustment to Antarctic station life (Palinkas, 1990).

Although past research on the traits and dispositions of Antarctic expeditioners has addressed a number of important issues in terms of adaptation to Antarctic station life, there are a number of limitations and gaps which need to be discussed. First, much of the existing personality research on Antarctic expeditions is based on narrow samples of single sex (mainly male) participants in American Antarctic expeditions, which unlike Australian expeditions, include a large navy contingent. Second, much of the existing personality research has limited generalizability because it has focused on the adaptation of single expeditions with few participants. Third, Antarctic station personnel differ in age, educational background and occupation, but existing research has rarely reflected the demographic diversity of Antarctic station teams (Rothblum 1990). Finally, as Suedfeld (1991) highlights, due to the ignorance of the role of psychology as a scientific discipline by the administrative bodies responsible for Antarctic research programs, social and

psychological research on Antarctic station life is not encouraged and has not progressed because, unlike other scientific disciplines in the natural sciences, human research in Antarctica continues to be perceived as a low priority research area.

Although much of the Antarctic psychological literature has focused on the individual adjustment to the harsh physical environment of Antarctic, some research has explored the social environment, beginning with the work of Lantis (1968) who suggested that the social environment rather than the physical environment is the primary source of stress for expeditioners. In particular, research on group formation has suggested that individuals who have low social status, a low need for autonomy, are dependent and have a high need to be controlled by others, appear to adapt the best to Antarctic station life, whilst those with a low status, but a high need for autonomy and control over others adapt poorly (Palinkas, 1990). Research has also referred to group problems and conflict, particularly alcohol-related problems among navy personnel on American stations highlighting instances in which excessive drinking by a few personnel was deleterious to the station community and to the station mission resulting in excessive noise, rowdy behaviour and fighting, alcohol related injuries and more vehicle accidents. Taylor (1974) refers to conflict between different age groups represented on stations and social conflict due to excessive drinking. Natani and Shurley (1974) also referred to excessive drinking, and according to Robertson (1988, cited by Rothblum, 1990) on the U.S. McMurdo Antarctic station there are regular meetings of Alcoholics Anonymous. Research has also suggested that expeditioner selection and screening should be undertaken at the group level rather than the individual personality trait level and on the basis of an individual's anticipated group status (Palinkas, 1990).

Although Antarctic station culture has not been the focus of any social or psychological investigations, some research has referred to group identity and group value systems. For instance, Palinkas (1992) suggests that whilst Antarctica has no permanent inhabitants, 'microcultures' have existed on the continent for the last ninety years and within these microcultures adaptation is "a process of negotiation between the needs of the social group" and that "the cultural systems of Antarctic stations are both a product of this negotiation and a set of rules which regulate this process" (p. 652). In discussing the factors that influence individual adjustment to Antarctic stations, Palinkas (1989) refers to "a value system which gives meaning to and orders the behaviour of station members and

which regulates social interaction” (p. 240). Palinkas (1989, 1990) also suggests that although the socio-cultural systems of stations differ from country to country, station to station and year to year, there are points of commonality and continuity in terms of group formation: (i) stations have a common scientific mission; (ii) researchers engage in a similar range of studies in the natural sciences, including, biology, glaciology, meteorology, oceanography and atmospheric physics; (iii) in addition, research station personnel undertake support work including maintenance, communications, cooking, and medical care; and (iv) expeditioners on U.S., Australian and other international stations are motivated to go to the Antarctic for similar reasons. According to Palinkas, these reasons include: earning and saving money, broadened experience, advancement, prestige, intellectual curiosity, increased technical expertise, and on some occasions, the desire to escape from the demands of the larger society such as marital or family problems and problems with authority. Palinkas (1989) also refers to similarities in group formation of Antarctic personnel and inter-group conflict, referring to occupational conflict between military personnel (who have a strong presence on U.S. Antarctic stations), and civilian groups.

1.2.8 This Research Investigation

Although past Antarctic research has referred to aspects of Antarctic station life and culture, research focussing specifically on Antarctic station culture does not exist. Past organizational research suggests that culture is an important factor in determining how well an individual will fit into an organization and research has found that “good fit” between jobs and people increases job commitment, satisfaction and performance (Caldwell and O’Reilly, 1990; Chatman, 1991; O’Reilly et al., 1991). Within the context of person-culture fit, it can be argued that ‘fit’ is far more important in isolated and confined settings, such as Antarctic stations, than it is in more accessible and less isolated business settings, which have been the focus of ‘fit’ research.

Whilst Antarctica has inspired explorers and those seeking a challenge, adventure or a once in a lifetime opportunity for a lifestyle with time for solitude and contemplation in the southernmost continent of the world, the reality is that individuals previously unknown to each other are transported to these isolated stations where they are expected to live and work harmoniously within the confines of a small station community for up to a year at time. With only three ships arriving a year, leaving an Australian Antarctic station may be

impossible prior to the arrival of the next ship. Australian Antarctic stations therefore represent a unique sense of physical isolation and social confinement and research exploring Antarctic station culture and the impact of person-culture fit is needed. It can also be argued that within the context of Antarctic expeditions, selection and recruitment procedures need to be effective in developing a culture that is consistent with organizational goals, and that recruits individuals who: (i) are able to live and work well in small, isolated mixed teams, (ii) possess relevant technical and social competencies, (iii) are physically and mentally fit and therefore able to undertake their station duties and complete a full tour of duty, and (iv) 'fit in' and contribute positively to the team.

When I set out to undertake this research in 1998, I contacted the Australian Antarctic Division by telephone and then in writing to inform them that I was a Doctoral candidate at the University of Adelaide interested in carrying out research on person-organization fit within the context of Australian Antarctic station life and culture. Given the relevance of this research to ANARE selection and recruitment, I was hopeful that the AAD would be interested in my proposal, at least from a human resource perspective. At the time I had been awarded a three year scholarship by the University of Adelaide and was confident that the AAD would respond favourably to the idea, particularly since I was not seeking their financial support and was prepared to explore any aspects of expeditioner selection and recruitment that they considered important.

After contacting the AAD Human Resource Branch, I was advised to discuss my proposal with the Polar Medicine Branch, which I was told was responsible for human research on Australian Antarctic stations. When I contacted the Branch by telephone, I was first asked a series of questions about my research proposal and then told that psychological and social research in Antarctica was limited because it was not a priority area of the Antarctic research agenda. I was advised that expeditioners in Antarctica would not respond well to having to complete questionnaires, and that in general, they did not respond favourably to having to participate in social research of this type. I was then asked whether I intended to apply for an Antarctic Science Advisory Committee (ASAC) grant, and that I required the AAD's support and an ASAC grant if I planned to undertake research in Antarctica. I realised that I had little choice but to apply for an ASAC grant if I intended to go, so I began preparing an application.

In total, I submitted three separate applications to conduct research on person-organization fit within the context of Australian Antarctic station life and all three applications were rejected. This was despite the fact that the applications incorporated feedback provided by ASAC, were approved by the University of Adelaide (including the University of Adelaide 'Ethics committee), and that participation was to be voluntary, with participants being asked to complete a simple card sort procedure in Antarctica. Interestingly, in the third instance the AAD forwarded the research proposal to 'two reviewers', a process that was not in accordance with that used to assess other ASAC grant applications, and I was not given an opportunity to respond to any of the queries raised by the reviewers.

These experiences were valuable in that they allowed me to gain insight into the Antarctic research application process, and as I did, I became aware that there was an obvious conflict of interest in the ASAC assessment process because, in effect, the AAD 'wears three hats': (i) the AAD is responsible for assessing ASAC human research proposals - decides if proposals will be accepted or rejected; (ii) the AAD staff involved in assessing research proposals (eg., Human Biology and Medicine Program Leader) undertake human research of their own in Antarctica (refer to Appendix A4); and (iii) the AAD is also responsible for the day to day running of ANARE expeditions and ANARE expeditioner selection and recruitment.

By the time the third research proposal was rejected, it was clear that my research proposal was unlikely to be supported by the AAD. However, my efforts were not wasted because this was a study of Antarctic station life and culture that could be undertaken from Australia and in many ways it had already commenced. Given that a winter expedition usually consist of less than 20 expeditioners, I knew that even if I was granted permission to participate in an expedition, my sample would be small and generalizability of findings would be limited because the information would be based on a single expedition.

A key aim of this research investigation was to explore Antarctic station culture and the experiences and attitudes of men and women toward Antarctic station life over time, and although a round trip would have been beneficial in permitting me to personally experience and observe Antarctic station life, it was my no means the only available method for collecting data on Antarctic station culture.

By focusing on the large and accessible population of returned expeditioners living in Australia, I undertook a series of both qualitative and quantitative studies on Antarctic station culture over the last 50 years of ANARE. Although this investigation was undertaken without any assistance from the AAD, it was made possible because of the support it received from the many returned Australian Antarctic expeditioners and ANARE Clubs¹⁵ across Australia who recognized its potential value.

¹⁵ANARE Clubs are community based organizations comprising returned Australian Antarctic expeditioners.

CHAPTER 2

Study I

2.1 Introduction

This chapter presents the results of a qualitative research study that explores the culture of Australian Antarctic and sub-Antarctic stations¹⁶. The results are based on a two-part interview with a group of Australian men and women who participated in Australian National Antarctic Research Expeditions (ANARE). Part one of the interview schedule explores participants' experiences and attitudes towards Antarctic station life and identifies the type of individual more likely to "fit" the context of station life and culture, whilst part two explores specific elements of Antarctic station culture, including symbols, heroes, rituals, stories, and values.

Section one of this chapter outlines the research method and procedure. Section two summarises participants' responses to interview questions and the themes identified in part one of the schedule. Section three outlines specific elements of Antarctic station culture identified in part two of the schedule and section four contains a general discussion of the findings.

2.2 Method

2.2.1 Participants

The participants were 31 returned Australian National Antarctic Research Expeditioners (ANARE) who lived and worked on an Australian Antarctic station between 1950 and 1999. It was a mixed age group (32 - 76 years) comprising 26 men and 5 women. Participants volunteered to take part in a study on "Australian Antarctic station life". Fifteen men and women were identified through a process of networking in which each participant was asked to nominate and contact another expeditioner about the study, and 16 were members of the ANARE Club Inc. in South Australia. The ANARE Club Inc. is an association of returned Australian Antarctic and sub-Antarctic expeditioners with branches in each Australian capital city.

Networking resulted in the identification of 16 possible participants of which one later refused to participate because he feared being identified by the Australian Antarctic Division (AAD). All 15 participants contacted through the ANARE Club agreed to take

¹⁶In this study the sub-Antarctic comprised Macquarie Island only. References to "the Antarctic", "Antarctic stations" and "Antarctica" will hereinafter also include Macquarie Island station.

part in the study.

Of the 31 participants, 29 lived and worked on an Antarctic station between 12 and 15 continuous months, including an Antarctic winter (referred to as “winterers”), whilst two participants had lived and worked on a station for up to three months over summer (referred to as “summerers”). Both summerers were women. Most participants had taken part in more than one expedition - the number of expeditions ranging from 1 to 7 per person. Table 2.1 contains additional information on the group, including age, station positions and the year of their last expedition to the Antarctic.

Table 2.1: Demographic information for Study I

Station Position	N
Station leader	2
Medical Doctor	4
Researcher	8
Meteorological technician	5
Communications technician	4
Cook/Chef	2
Trade worker	6
Expedition Year	
1950-59	1
1960-69	6
1970-79	5
1980-89	6
1990-99	13
Age (at time of interview)	
Mean (in years)	51.97
Standard deviation	11.88
Expeditions (no. per person)	
Mean	2.42
Standard deviation	1.54

2.2.2. Procedure

Each participant was administered a semi-structured interview schedule consisting of a series of open-ended questions. The schedule was presented to participants in a quiet and private space, usually in their own home or an agreed location. It consisted of two parts. Part 1 explored participants' attitudes toward Antarctic station life and culture. It included questions on the "the best aspect" and "the worst aspect" of participants' experience in Antarctica, whether and why they would recommend the Antarctic to friends as a good place to work and what advice they would give about "fitting in" to the culture of Antarctic stations. Table 2.2 contains the questions to part one of the interview schedule.

Table 2.2: Questions to Part One

-
- Describe the best aspect of your experience in Antarctica.
 - Describe the worst aspect of your experience in Antarctica.
 - Would you recommend the Antarctic to your friends as a good place to work? Why?
 - Imagine that a close friend was interested in going to Antarctica as an expeditioner. If he/she asked you what they required to fit in to the culture of Antarctic stations, what advice would you give?
 - If they asked you what is required in order to be a good station leader, what advice would you give them?
 - How could the culture of Antarctic stations be improved?
-

Part two of the interview schedule explored individual elements of Antarctic station culture using Edgar Schein's model of organizational culture (Schein 1984). According to Schein, organizational culture manifests itself in three fundamental levels: (a) visible artefacts; (b) values; and (c) basic underlying assumptions. The first level of culture comprises *visible artefacts* which includes everything from the physical environment and dress codes to organizational symbols, heroes, rituals and stories. The second level of culture comprises *values* and norms that are espoused by an organization, whilst the third and deepest level of culture comprises *underlying assumptions* or unconscious learned responses that determine how members perceive, think and feel (Schein 1984,1990).

The elements of culture explored in this study comprised: (i) *visible artefacts*, including symbols, heroes, rituals and stories; (ii) espoused *values*; and (iii) inconsistencies between espoused values and observable behaviour which form the basis for *underlying assumptions* (Schein 1990). Table 2.3 contains the questions to part two of the interview schedule.

Table 2.3: Questions to Part Two

An organization's culture may be characterised by symbols, heroes, rituals, stories and values that are unique to the organization and recognised by its members. Please consider the **symbols, heroes, rituals, stories** and **values** that may characterise the culture of Australian Antarctic/sub-Antarctic stations and provide examples of each below.

Symbols: (eg., words, gestures, pictures or objects that carry a particular meaning including, language or jargon, names, clothing, hairstyles, flags etc).

Heroes/Legends: (eg., people, alive or dead, who did things that are still talked about on stations years later).

Rituals: (activities considered socially essential eg., birthday's, dinners, social ceremonies etc).

Stories: (eg., stories which circulated among expeditioners about events relating to current or past expeditioners, rule breaking incidents, or coping).

Values: (the key characteristics valued and sought by the Australian Antarctic Division in expeditioners (please refer to the characteristics actually sought, not those espoused)).

What are the key characteristics not valued or sought by the Division in expeditioners?

What are the most salient (most obvious) aspects of Australian Antarctic/sub Antarctic stations?

The interview schedule was presented in the same way to all participants with part one completed before part two. Participants were asked to complete the interview by providing a written response to each question and were encouraged to further discuss their responses with the interviewer. Their comments were not recorded to ensure participants were encouraged to talk openly and honestly about their experiences. Although the possibility of tape recording interviews was discussed with several participants at the start of this research, each expressed a strong preference for their interview not to be recorded.

The interviewer therefore kept a field diary to record additional comments and observations and a tape recorder was never utilised. The interview schedule itself took between 60 - 90 minutes per person to complete.

2.3 Results and Discussion

The analytical framework emerged from the interview questions and the themes from participants' responses. Qualitative research methods outlined by Richard Krueger (1997) and Miles and Huberman (1994) were used to facilitate data analysis and the categorisation of themes. A summary of participants' responses to each question and the themes identified are presented below.

The information contained in parentheses includes an initial indicating the person, the year of the participant's last expedition to Antarctica, and to highlight gender, responses made by women are marked by an asterisk (*). In order to maintain confidentiality, initials were randomly assigned, although consistent across responses. The expedition year is represented in five year categories, and any other identifying information has been removed.

2.3.1 The best aspect of Antarctica

When asked to describe the best aspect of their experience in Antarctica, all participants referred to: (i) the unique beauty of the Antarctic environment, with particular reference to scenery, wildlife and the opportunity to get away from the station for fieldwork and outdoor activities; and/or (ii) the sense of "personal achievement" and "privilege" associated with the opportunity to participate in an expedition to the Antarctic.

Typical responses to this question included:

The environment and the wild life. The feeling of being privileged to have been there (B., 1990-94*).

The pleasure and experience to go to a place where hardly anybody goes. A different way of acclimatising and living, and I was single (R., 1975-79).

During fieldwork in summer - I worked mainly alone. The silence and breathtaking beauty were humbling and will stay with me forever (J., 1995-99*).

The closeness to the environment;

The wildlife on Macquarie Island;
Taking part in history; and
Seeing a cycle of penguins over winter-summer (A., 1995-99).

Getting off base - a chance to explore (K., 1990-94).

Doing a trek across the ice and getting away from the station (P., 1960-64).

Interestingly, men who participated in expeditions prior to the 1980s also referred to “comradeship” and “mateship” among fellow expeditioners:

The close comradeship of my fellow expeditioners. In my army service I was a paratrooper and the airborne spirit was famous for its mateship but the feeling between the Casey expeditioners exceeded even the airborne comradeship (S., 1975-79).

My job, my work mates, the animals and birds, seeing the seasons change and the sea ice form, experiencing the cold and blizzards, and the traverse to Mt. King and return. (C., 1975-79)

Thus, in describing the best aspect of their experience in Antarctica, participants made reference to two recurring themes. First, the opportunity to travel to the southernmost continent in the world and witness first hand the unique Antarctic wildlife and wilderness. Second, the sense of personal achievement associated with being selected to take part in an expedition. The two themes featured strongly in responses to this question, irrespective of respondents’ gender, the year of their expedition to Antarctica or their station position.

From a thematic perspective, it is also of interest to note that men who participated in expeditions prior to the 1980s, nostalgically referred to social aspects of station life, whilst those who participated in expeditions from the 1980s onwards, made no such references. These differences suggest the possible existence of two distinct eras of Antarctic station life and culture; the period prior to 1980 and the two decades of expeditions since that time.

2.3.2 The worst aspect of Antarctica

When asked to describe the worst aspect of their experience in Antarctica, participants commonly referred to social friction on stations, including interpersonal conflict, professional animosity, and lack of privacy. In particular, women referred to personal experiences of sexual discrimination and harassment, whilst men referred to experiences

of interpersonal conflict and group tension. Some participants also referred to personal sacrifices, such as experiencing danger due to weather conditions, missing their family and friends in Australia, and experiencing relationship difficulties at home.

Typical responses from men and women included:

Appalling personal confrontation with sexism and sexual harassment...Feeling unsupported or inadequately supported by head office (L., 1990-94*).

Some difficulties as a scientist and a woman (G., 1985-89*).

Being in each other's pocket for 24 hours a day (K., 1990-94).

The shift work (unusual hours), and the bickering between some 9 to 5 staff and shift workers (M., 1985-89).

Community splintering & intolerance! (Q., 1990-94).

Being isolated when something happens at home. Learning of friends being ill or dying back home (D., 1995-99).

Personality clashes with some other expeditioners (U., 1980-84).

Losing my relationship with my girlfriend (E., 1965-69).

Missing my family and missing things that grow (S., 1975-79).

I enjoyed it all, whether it was hard going or not. It's your attitude. For instance, a weather observer refused to do his work and went down hill (i.e. deteriorated in attitude). His colleagues then had to do his work for him. We also had a mad radio communicator who was caught banging the OIC's (Officer in Charge) head on the floor one night (T., 1975-79).

References to interpersonal conflict on stations featured strongly in responses to this question, irrespective of respondents' gender, the year of their expedition to Antarctica or their station position. The results also indicated that the sources of conflict identified by men and women were distinct. Women identified sexual discrimination as a major issue of concern and the worst aspect of their experience in Antarctica, whilst men referred to group tension and professional animosity.

Responses to this question highlight the prevalence and magnitude of interpersonal and gender-based conflict on Antarctic stations and the profound impact of such conflict on the individual and the group. Further research is needed to explore the extent to which social problems on stations are due to group isolation or the personality of certain

individuals, and the extent to which their occurrence may be reduced by expeditioner selection and recruitment procedures.

2.3.3 Is Antarctica a good place to work?

Participants were asked: *Would you recommend the Antarctic to your friends as a good place to work?* and were asked to qualify their response by explaining why?

The majority of men and women indicated that they would recommend the Antarctic to their friends as a good place to work, albeit with provisos and reservations. Only three participants indicated that they would not recommend the Antarctic as a good place to work and in all instances participants qualified their responses.

From a methodological viewpoint, asking participants to qualify their response was essential. For example, in one instance a “no” response was qualified with “because I’m selfish and want to preserve the uniqueness”, and in another instance with: “you have to want to go, not be recommended to go by your friends”. Further, a large number of “yes” responses were conditional and if participants were not asked to qualify their response, the context of a “yes” or “no” responses to this question could easily be misinterpreted.

Typical narrative qualifications to a “yes” response included:

It’s a difficult question. It depends on the person. Could they cope with being away in an isolated place? Could they stand the pressure of being away if they were married, or from their loved ones? ..and now there are women! (R., 1975-79).

To some, not all. It is not appropriate for some people and others are not cut out for it, so they would have a hard time professionally and socially if they’re not cut out for it. For example, there were two geologists, they were PhD students. They were doing their own research and they were supposed to be each other’s field assistant. It was a ‘recipe for disaster’ (A., 1995-99).

Only if you’re single and have no other responsibilities/pressures (M., 1985-89).

With provisos - you need to be tolerant; expect to be disappointed by the people but not the environment; and be prepared for the ‘loneliness of command’ (B., 1990-94*).

In the main ‘yes’ but this would depend on who they were. Some just wouldn’t have the required level of interest and degree of ‘passion’ to give the commitment required to make a go of it. There are enormous benefits and rewards but sacrifices too (N., 1995-99*).

Participants reported that they would recommend the Antarctic to their friends as a good place to work but with reservations. Narrative qualifications to the question indicated that most participants would only recommend the Antarctic to friends that possessed certain characteristics, most notably, a willingness to make personal sacrifices in terms of contact with family and friends in Australia, and a willingness to sacrifice their personal values in order to avoid interpersonal conflict on stations. Reference to numerous provisos and conditions suggests that the demands of Antarctic station life are such that not everybody will “fit in”. The personal attributes identified as relevant for “fitting in” include: a passion and interest for the Antarctic; tolerance of group friction and, in terms of aspiring station leaders, a willingness to accept the “loneliness of command”.

2.3.4 “Fitting in” to the Antarctic station culture

Participants were then asked: *Imagine that a close friend was interested in going to the Antarctic as an expeditioner. If he/she asked you what they required to “fit in” to the culture of Antarctic stations, what advice would you give?* All participants identified social competence as the principle requirement of good culture “fit” and several also referred to job competence. Interestingly, no participant referred to job competence alone, and a similar range of social skills were identified by participants, irrespective of gender or expedition year.

Typical responses to this question included:

Be easy going and know when to keep your mouth shut (V., 1950-54).

Strong personality, belief in self, reliable, fit, competent in work area, ability to help others, not thin skinned (E., 1965-69).

The person would need to be tolerant, considerate, confident in their role and need to like people. The person would have to make sacrifices and be accommodating in times of social friction (Z., 1990-94).

Have or generate the ability to put up with other people no matter what their personal habits or opinions (U., 1980-84).

Be themselves; for women - to expect the occasional coarse language - but not to be afraid to put people back in their place if they feel the need to do so (D., 1995-99).

Try to get on with everyone and off with no one. Not to be too picky. Be easy going and try and take an interest in others' interests, if they wish (O., 1990-94).

You have to be flexible and even-tempered. It doesn't matter where you're from or what your trade is (M., 1985-89).

Be friendly and extremely tolerant. You are living together in close proximity. Therefore more consideration is required towards your colleagues' habits. You forget differences because you need each other...you can't walk away, you see them (colleagues) constantly and are exposed to their habits all the time. Humour was the most important thing after food (S., 1975-79).

Desired qualities- flexibility, tolerance of individual differences, take time to get to know others on station and appreciate their individuality. Be prepared to get involved with whatever is happening and volunteer whenever extra hands are needed. Try to get off the station as much as possible, but not at the expense of others...(J., 1995-99*).

Responses to the question of what one requires in order to "fit in" to the culture of Antarctic stations were organised around the notion that expeditioners needed to possess certain individual characteristics and social skills. For instance, participants highlighted that in order to "fit in", expeditioners needed to be "sociable", "approachable", but also required the ability to avoid interpersonal conflict at any cost and to be tolerant of the idiosyncrasies and inappropriate behaviour of others. Reference to "tolerance" in particular, was a striking feature of the majority of responses to this question and, within the context of gender, men who wintered with women highlighted the need for women to be prepared for confrontation, in some instances directing their advice to the interviewer herself.

2.3.5 Characteristics of a good Station Leader

When asked to indicate what one required in order to be a "good station leader", men and women referred to a number of social and people management skills, including "being sociable", "fair", "honest" and a "man leader". Good communication and conflict resolution skills were frequently identified as essential for good station leadership and the station leader's role was occasionally referred to as "the loneliest job" on an Antarctic station. "Loneliness" was discussed within the context of station leaders having to work on their own, often in difficult and hostile circumstances, with little real administrative or professional support from the AAD.

Responses included:

I am not sure as in my year the four of us (the station leader on each station) were very different. I do not believe that the Antarctic Division knows what it wants - except a harmonious station which, in my opinion requires you to adjust your values, or pay the consequence of not falling in with the expeditioners (B., 1990-94*).

Firstly, a clear public indication from the Antarctic Division of what they want the expedition to achieve and then consistent support from the Antarctic Division for the station leader as long as this aim is being pursued. Station leaders shouldn't be paid to be popular (W., 1985-89).

Be able to earn expeditioners' respect. Have all the attributes of a good expeditioner (eg., tolerant, patient, good sense of humour, practical, ability to relax). Realise that most other expeditioners are qualified in their chosen field. Be a people person (C., 1995-99).

Whatever you do you probably can't get it right - so be open, honest, fair, consistent and passionate and have faith in your own values. It's a lonely job so you need strong inner resources to survive (L., 1990-94*).

Be consistent, approachable, sociable (D., 1995-99).

Respect is no. 1. You need to be able to walk the tight rope between being a leader and a friend (X., 1995-99).

Be prepared to be lonely. Learn how your group wants to be led. I've had right and left (political leadership styles) (Q., 1990-94).

Organizational skills, tolerance, "the judgement of Solomon" (S., 1975-79).

The ability to strike a balance between being one of the boys and maintaining authority (I., 1980-84).

- 1st You'd have to be mad
- 2nd You must be able to establish rapport with men
- 3rd You must be able to communicate, even when it appears to be unnecessary
- 4th You must be fair (H., 1965-69).

At Mawson we had a very capable leader. About 26 years (of age). He replaced the OIC (Officer in charge) who was supposed to be there. You have to be able to liaise with everybody but keep a tight hold on general activities. If I am the leader I need to keep people in line.....Home brews started. Beer rations were four cans a week. It got to the point where home brews increased too much. The OIC had to go out on a field trip and his Deputy let them do whatever they wanted. You have to have the qualities of a leader as well as be able to get on with others. On Macquarie Island the leader was a schoolteacher. A lot of his peers were in the summer group. He couldn't communicate - he kept leaving notes rather than talking to people. He wasn't very popular. He kept using the pin-board (for communication) and no one was allowed to use it (Y., 1965-69).

Good “man” management skills (F., 1960-64).

Fairness, ability to reason logically, leadership respect - although this is hard to define. They have to be good at what they do and know how to get the best out of people (P., 1960-64).

When defining the characteristics of a “good station leader” participants referred to a range of social, managerial and conflict resolution skills that station leaders required. It is interesting to note that some male and female participants suggested that station leaders were inadequately supported by the AAD, highlighting the need for a review of the type of support services offered to station leaders during expeditions. Some gender differences were identified in responses to this question, in particular, a striking feature of the responses of most men, irrespective of the year of their expedition, was the recurring reference to a station leader as “a leader of men”, “one of the boys” with “man management skills”. Indeed, there was no reference to women expeditioners or women station leaders, despite the fact that women have been recruited as station leaders for 12 years and as wintering expeditioners for 20 years.

2.3.6 The culture of Antarctic stations

When asked to explain how the culture of Antarctic stations could be improved, participants commonly referred to the need for improvements in the social functioning of stations with particular reference to better gender representation on stations, and improvements to the selection and composition of station personnel.

Women referred to the male image of station culture and identified a number of solutions, including the need for more women on stations and the removal of excessive alcohol consumption. Some women also referred to solutions for overcoming friction between scientists, who were often women, and the trade workers who were men.

Responses to this question by women included:

Add more women, and work harder to acknowledge that its more a “family situation” than a pub. Encourage reading, studying along with outdoor activities (L., 1990-94*).

Get rid of the ‘macho’ image; more careful selection of expeditioners; reduce the amount of alcohol, and the Antarctic Division has to support the station leader when they are trying to follow the Division made rules (B., 1990-94*).

From the point of view of a scientist I think that tradies need to be educated about what constitutes our work so that they don't see field work as one big jolly (field trip), and there needs to be a more even mix of men and women (J., 1995-99*)

Men of more recent mixed gender expeditions tended to argue that some change was necessary within the context of improving station life. A number of strategies for achieving change were identified, including: better representation of women and families; better selection of expeditioners; and less emphasis on bureaucracy and policy. Typical responses by this group included:

Antarctic work should be better integrated into ordinary Australian life. At present the Division frequently collects people whose lives are already disrupted, it removes them from their ordinary support networks for a year or more and then dumps them. Part of the problem is that the people who select and recruit expeditioners haven't necessarily wintered in Antarctica...(W., 1985-89).

It is pretty good, but it's been bad in the past. It's not a normal community. There are no old people or young people. Children add levity. You notice how much good they do. To improve Antarctic social life you have to shift it to "normal society". This will improve the culture. The introduction of women was good. I have experienced both (all-male and mixed). On my first trip there were no women (1978). Many think there should be no women, but I believe women have levelled it out. Decency has returned to the fold. Blokes speak nicely and there is more interest on stations. Women offer a softer approach - it used to be really rough with alcohol and bad language. With the advent of women came improvements to station accommodation (A., 1995-99).

In some way the greater "public service" bureaucracy now evident, is a backward step (O., 1990-94).

Most participants of all-male expeditions prior to the 1980s were ambivalent about the need for change to station culture and questioned the benefits of women on stations. Whilst some participants, referred to the need for better expeditioner screening to overcome friction between scientists and trade workers, others argued that changes to station culture were not necessary. Typical responses by this group included:

The tradesmen could be enriched with more diversions.
The scientists are generally too busy to be bothered (F., 1960-64).

There is a split between the scientists and tradesmen....There was a brash young physicist that annoyed the others including the cook and the diesel mechanic...the doctor didn't regard himself as a scientist. The rest were scientists. The scientists would have dominated then (1950s) but not now because the composition of the teams is very different (V., 1950-54).

There is no way you can really improve it. The older guys say they should never have allowed women. Then of course there was the first female station leader (E., 1965-69).

Expeditioners lived as a family... people helped each other. We enjoyed each other's company. I don't know about having women there though (T., 1975-79).

Culture is a private attitude. Casey culture was unique and accepted, no improvements required (S., 1975-79).

More careful selection. Make sure all understand the objectives of the year (E., 1965-69).

More even mix of men and women, better screening of personnel, especially trade workers (U., 1980-84).

Men and women referred to the need for more women to be recruited on stations and the need for improvements to expeditioner selection and recruitment. For instance, many participants suggested that the culture of Antarctic stations could be improved dramatically if the composition of station personnel resembled that of a normal community, with more women and families (though the recruitment of families (with children) is probably not feasible within the context of current services and facilities on stations, such as lack of schooling). Others referred to station culture as problematic, and attributed station problems to: (i) the AAD's method of expeditioner selection and recruitment; and (ii) the fact that those responsible for selecting and recruiting wintering expeditioners had not necessarily wintered themselves. Further, although men who had participated in all-male expeditions prior to the 1980s were often against women participating in expeditions, many argued that a change in culture was necessary to help resolve group divisions, particularly between scientists and trade workers. This finding provides evidence for the existence of professional animosity between scientists and trade workers in expeditions prior to the 1980s.

2.3.7 Cultural change in Antarctica

A recurring theme in participants' comments was the notion of change to Antarctic station culture. In comments to the interviewer that transcended the scope of the interview schedule, participants frequently referred to "major turning points" or "changes" to Antarctic station culture. This was particularly characteristic of the responses of men who participated in expeditions during the 1960s and 1970s and returned to the Antarctic again

in the 1980s and 1990s. The identified catalysts of cultural change were:

- Technological advances in communication;
- Changes to accommodation; and
- The introduction of women expeditioners.

A summary of each of these is presented below.

Technological advances in communication

A significant number of men identified technological advances in communication as a major source of change to Antarctic station culture. Technological changes were discussed within the context of improved methods of communication, increased access to stations by mainland Australia, and the impact of these changes on stations life and culture.

Participants referred to the period between 1980 and the early 1990s as a time of major technological change for stations beginning with the introduction of the satellite telephone service that provided stations with access to telephone communication for the first time. Prior to the satellite telephone service, radio communication, which was characteristically less reliable, was the principal method of communication between stations and Australia. Other communication changes then followed, including the introduction of Fax (Facsimile) communication which replaced the telegraph, direct telephone communication which replaced the operator based satellite telephone service, and access to the Internet and electronic mail which provided an alternative to Fax and telephone communication.

While these changes provided stations with significantly more efficient and effective communication options, most participants highlighted that they also resulted in dramatic and irreversible changes to Antarctic station life and culture:

...the culture has changed over time due to technology so people who went before those changes are not inclined to go again because it's not the same...There are phones by the bedside and people can make as many phone calls to Australia as they like. Direct computer link-up via modems means that tradesmen can now be contacted immediately from the Division about work to be done. There is a computer in all workstations and your work for the day appears on the screen and stays there until you have finished. Sometimes you may leave and return to find major changes to building works eg., someone in Hobart,

because all the engineers are based there now, may decide to have everything painted purple and they just send you the instruction directly via computer and you have to comply, all decisions are made in Hobart, not like in the past (Z., 1990-94).

With email and computer technology there is less flexibility now. For many technical people for instance, they receive job instructions via the computer directly from the Division that they have to complete on a daily basis. So while the Antarctic and the sub-Antarctic are known for physical isolation, computer technology and communication advances have changed this dramatically so you can't really get away (from your employer)...in some ways technology therefore also means less flexibility (D., 1995-99).

Changes in communication have changed the make-up of stations. There were five radio operators at each station until INMARSAT (satellite communication) was introduced. This year there are no radio operators, last year there was one.....In the 60's radio operators were prominent on stations. Expeditioners needed to organise to have a ham radio operator at home so that their family could receive their messages. The radio communication was used in lieu of the telephone. Teleprinters were also used for written messages. Expeditioners wrote messages on paper and S would receive them at the Division from the teleprinter (radio transmission). There was a word quota per expeditioner per month. The Division wrote up a list of codes to reduce the amount of words required for communication. X played a major role.....(H., 1965-69).

There have been changes, eg., communication... there is no restriction on words as in the "rad phone" (radiophone) days, so you can virtually go to your room and talk with people at home for days. This is significant in terms of the culture change from the old days when there were codes and quotas on words per expeditioner per week (K., 1990-94).

Communication was almost nil back then. Now the Division controls the station; before, expeditioners would make their own decisions (I., 1960-64).

Communication is great. Better than here. You get free access to the Internet. You can make phone-calls to anywhere in Australia. There are benefits, however, there are also drawbacks. When something goes wrong it travels like wild fire across stations (eg., X's situation) when the station leader had called a meeting for 10.00 and wrote it on the board. Before the meeting somebody had already rung another station and people already knew there was a problem. It is possible for a station leader to close the station down and break all communication for a given period. It was done in Mawson when they had a major fire. We didn't know until we got back Prior to 1985 there was a satellite phone system that was quite costly and required an operator. Connection wasn't always good and it had to be booked in advance for 15-minute intervals (D., 1995-99).

Participants' comments on culture highlight a link between technological advances in communication and changes to Antarctic station life and culture, particularly from about 1980 onwards. Men who participated in expeditions prior to 1980 and returned to the Antarctic again during the 1980s and 1990s, argued that whilst technological advances dramatically improved the quality and efficiency of communication between the Antarctic and Australia, technological advances also introduced irreversible changes to station life.

For instance many emphasised that as a result of advances in communication, expeditioners had less flexibility and autonomy in their work and many referred to the years before the advent of technological changes nostalgically, highlighting that although in the past communication with Australia was unreliable and station accommodation was very basic, the Antarctic experience itself was far more rewarding and satisfying.

Changes to accommodation

The original Antarctic station buildings were constructed using simple lightweight materials that were transported from Australia to the Antarctic by ship and erected quickly by unskilled labour. By the mid 1970s the original station buildings were deemed to be in poor condition, and in 1981, the Australian Government approved a building program to re-construct three new Antarctic stations. As a result, major development and construction work to station accommodation took place from the early 1980s and continued to the late 1990s when the re-building was completed. Although the new buildings were shipped to the Antarctic in modular form, they required concrete foundations and skilled construction workers to erect them and this led to changes in the focus and composition of expeditions.

Whilst the participants in this study identified positive aspects of the development and construction work (e.g., the improvements in station comfort and the inclusion of new facilities), negative aspects to the development process were also outlined. For instance, in comparing the new station buildings with the original accommodation, two men who participated in ANARE expeditions in the 1950s suggested that the accommodation upgrade made stations less appealing:

The situation then (1950s) was rather primitive but it was comfortable. Now the accommodation facilities are much more sophisticated and very comfortable....and now there is the opportunity to operate on a larger scale...but it was smaller and more pleasant back then (B., 1980-84).

The station loses something if you're going to have like the red shed (new station accommodation in Mawson), toilets shared by 100 people....nobody takes care of them, whereas before you had a little hut with seven people in it and it had its own toilet and it was self-policing...now it is quite easy to say someone else will do it...and people aren't so careful with equipment....it (new accommodation) may be engineeringly efficient but not socially efficient (B., 1980-84).

Similarly, men who had experienced Antarctic station life prior to the 1980s and returned to the Antarctic again in the late 1980s and early 1990s, argued that although improvements to accommodation made stations more technologically advanced, they did not improve the social functioning of station teams:

Major changes in accommodation took place in the 1980s....The living quarters have become quite luxurious to live in.....The changes are massive and somehow because of technological advancement and modern luxuries, Antarctica is less appealing as a destination I have been several times and I've noticed major changes in lifestyle and Antarctic experience in that time.....the sense of isolation isn't as great any more due to technology and high standard of living quarters. There are heated corridors and the latest in technology with access to Internet etc updated every two years. People no longer experience the blizzards and the old style walking from building to building. Many do not leave the inside of the stations the whole time except for some scientists who travel to more remote parts. You may go to Antarctica and never really experience the physical environment outside. Access to Internet and email means that people often spend the whole time inside and are no longer as isolated. The experience is not what it used to be (Z., 1990-94).

Macquarie Island is much more like a village - bedrooms have curtains instead of doors- but the other (new) stations are too spacious and isolating in their design. For instance with the building of rooms with doors, people can now sit in their rooms and play computer games all the time and be quite isolated. Previously there were curtains. The accommodation (in the upgraded stations) is also too expensive to run now (C., 1995-99).

The advent of building construction work dramatically changed Antarctic stations physically and socially because it introduced large numbers of construction workers to stations. For instance, during the period in which Mawson, Casey and Davis stations were re-constructed, construction and trade workers represented the largest professional group on stations and their presence had a major impact on all aspects of Antarctic station life. Since voting was often used in group decision-making and construction workers outnumbered every other group, they usually dominated station decisions and, in the process, increased the potential for professional rifts. Moreover, one participant attributed major problems on Casey station (officially referred to as the *Casey Mutiny*), to the presence of a large number of construction workers on Casey station during that year:

From the mid 1980s up until 1997 there have been three groups of expeditioners in each station:

- **maintenance** - maintain old station facilities
- **construction crew** -build new stations
- **scientists** - carry out research

Apart from these there is the station leader and the medical officer....The *construction crews* have dominated stations up until 1997. Their job has been the construction of

buildings, including workshops and station accommodation. They were employed by the Department of Housing, rather than the Antarctic Division. The bulk of the buildings were completed by 1995-96. Casey was finished first..... Stations often use voting for decision-making. Voting therefore meant that until now, construction workers (the greatest in numbers) virtually got their way...and whilst the station leader is appointed by the Division, the Deputy is appointed by the group, so the Deputy was usually the construction foreman (D., 1995-99).

In Casey in 1996 there was a 'mutiny' (i.e. there was major conflict between expeditioners and the station leader on Casey Station). It (the conflict) was due to the building works at the time and the large number of construction personnel sent to the station. They (personnel) were sent by the Department of Housing and Construction who employed them. The group turned against the Station leader and X (from the Ant Div) had to go down (to help resolve the conflict)From the mid 80s whenever there were problems with expeditioners – they were mainly due to the building works at Casey (A., 1995-99).

These comments suggest that the upgrade of station accommodation had a major impact on Antarctic station life and culture. While the construction of new buildings and facilities dramatically improved the physical qualities of stations, these physical changes altered the social fabric of Antarctic stations by: (i) permitting an influx of construction workers who became a dominant force in station decision making, (ii) moving the focus of station activities from science to construction work, and (iii) making stations spacious and luxurious on the one hand, and isolating on the other hand. Although officially, the *Casey Mutiny* was never attributed to one professional group, its occurrence highlights the magnitude of social conflict on stations. It also highlights the need for the selection and recruitment to place more emphasis on group compatibility, since in an environment like Antarctica where individuals cannot be replaced, social compatibility is as important as technical competence (Biersner and Hogan 1984; Rothblum, 1990).

Women on stations

While Australian women scientists first participated in ANARE summer expeditions to the sub-Antarctic in 1959, it was not until the mid 1970s that Australian women were first included in ANARE winter expeditions. In 1976 a medical practitioner became the first woman to winter on the sub-Antarctic station of Macquarie Island, and in 1981 the first Australian woman wintered on the Antarctic continent. In the last two decades, mixed gender groups have become a common feature of ANARE as women are increasingly recruited as station leaders, scientists, medical practitioners, chefs and technicians. Despite this trend, men in this study frequently referred to the inclusion of women in ANARE as a recent change. In particular, those who participated in all-male expeditions

prior to the 1980s were often critical about the introduction of women to expeditions and cited examples of women not “fitting in” (eg., see comments below), whilst the men who only participated in mixed gender expeditions frequently referred to the benefits of women to Antarctic station life.

Comments by men who participated in all-male expeditions prior to the 1980s include:

....Now they have women going down. We were unanimously against women going down (I., 1960-64).

There was a female (trade worker) recently ...she had been refused X times and was allowed to go ...because the Division was pressured to send more women, but she shouldn't have been selected because she wasn't very good....If she had done the things she said she had, she would be 110 years old. They shouldn't have let her go.... She had heaps of problems. The tradies called her a bludger on the job, but the non-tradies and I, were more sympathetic. There were really two sides to it. The tradies though didn't like her, the others thought she was OK. 1/2 the station thought she was a bludger and the other half thought she was OK (C., 1995-99)¹⁷.

1981 was the first year they sent a woman to an Antarctic station. She was a Doctor and was given a pretty hard time by some of the expeditioners that year. In 1976 the first woman to go to the sub-Antarctic was also a doctor on Macquarie Is. (S., 1975-79).

It (culture) has changed in some ways and remained the same in a lot of ways...we are still dealing with human frailties...people get annoyed over certain things and will continue to do that.. there could be a problem with more liquor available which does tend to lead to more aggressiveness sometimes...it is very much the same from year to year. You have your petty squabbles as any family does but they're normally smoothed over. The OIC (Officer in charge) has a fairly heavy task of looking after his family especially now that there are women down there. (B., 1980-84).

Comments by men who only participated in mixed gender expeditions include:

The problem is they do not send enough females on one station. For instance in X station they only had one female and she was a scientist. One male on the station told her that as soon as she got on with someone her problems would go...a really rude thing to say.the problem was partly to do with the fact that females usually only apply to go as station leaders, scientists, chefs or medical practitioners (Q., 1990-94).

The introduction of women in the mid 80s changed things.. although there were women prior to 1985, they were few in numbers, eg., between 1980-85 women in Antarctica included a medical practitioner once and a chef another time (Z., 1990-94).

¹⁷Participant's first expedition was prior to 1980 and was all-male.

The idea of women in Antarctica is a good thing. They have improved the culture by creating a softer atmosphere and by making the station composition closer to a normal community. In many ways it was the advent of women that led to the wonderful improvements in station accommodation. Even though it (re-building) may not have been done specifically for the women, it occurred at the time women started going. There needed to be major changes in the accommodation for women, so in many ways it was the advent of women that made the current facilities possible. Things used to be quite rough - alcohol, swearing - really bad stuff before women and even though some argue otherwise, the stations should be like normal communities...women have made things better (A., 1995-99).

The results of this study indicate that men's references to the impact of women on Australian Antarctic station teams varied according to the extent to which they had participated in mixed gender expeditions. The results also highlight that men who participated in all-male expeditions prior to 1980 were often critical of the inclusion of women in expeditions, despite the fact that most had never actually participated in mixed gender expeditions. For these men, the introduction of women to ANARE represented a significant turning point in Antarctic station life and an end to the all-male era of ANARE culture. It is of interest to note that in contrast, those who had participated in mixed gender expeditions during the 1980s and 1990s only, frequently referred to the inclusion of women as a positive aspect of Antarctic station life and culture and suggested that problems existed because women were under represented on stations.

2.4 Elements of Antarctic Station Culture

Part Two of the interview schedule explored specific elements of organizational culture. Participants were asked to consider the symbols, heroes, rituals, stories and values that characterise the culture of Australian Antarctic stations and to provide specific examples of each.

A summary of responses to Part Two of the interview schedule and the themes identified are presented below.

2.4.1 Symbols of Antarctic station culture

Participants identified a number of symbols that characterise the culture of Australian Antarctic stations comprising: language or jargon, clothing, hairstyles and artefacts.

Language

Language was the most frequently identified symbol of Antarctic station culture. Almost all participants in this study referred to the use of “station names” or “nicknames” for expeditioners as well as a variety of other terms used to identify station clothing and furniture, field trips, weather conditions, and station positions. The earliest reference to language as a cultural symbol was by a member of the 1950-51 ANARE expedition to Macquarie Island¹⁸.

Evidence gathered in this investigation also reveals that technology impacted on language since telegraph codes used by expeditioners to communicate with friends and family prior to the introduction of satellite phone communication, became a part of the spoken language and continue to be used on stations today. In addition, whilst the majority of examples of language cited were common to all Antarctic stations, expeditioners’ “station names” were developed by individual station teams and continued to be used by expeditioners in ANARE reunions many years later. A list of all identified terms and their meanings can be found in Appendix B2.

Comments by participants included:

A local language developed with local phrases etc. This was not noticed by us but raised as a peculiarity by incoming expeditioners (E., 1965-69).

“Donga” (Sleeping quarters)

“Fort Knox” (Grog store)

“Homers” (Home brewed beer)

“Slushy” (Cooks assistant)

“OIC” (Officer in charge)

“Jolly” (Trip)

“White out”(Fog)

“Wyssa”(Telegraph code: I love you darling) (H., 1965-69).

Certain jargon & slang words used on all Australian (Antarctic) bases e.g., talking about being “blizzed in” (blizzard outside), the tractor got “slotted” (stuck in the snow), we went down to the “dog line” (reference to Antarctic dogs) (C., 1975-79).

¹⁸The earliest reference to the use of station nicknames and language communicated to me was by a weather observer in the ANARE expedition of 1950-51. This man was not a participant of this study. Although his comments are not included here, they are presented in Appendix B1.

Telex codes became part of the language...base names & nicknames about 50%...There were sayings & jargon - some based around telegraph codes. MORSE code was the go back then and it impacted on jargon (F., 1960-64).

“JAFA” (Just another f..king academic)

“Donga” (Bedroom)

“SNAFU” (Situation normal all fouled up)

“Boffin” (Scientists) (M., 1985-89).

“Wizza” (Lots of love - message from home)

“RTA” (Return to Australia) (K., 1990-94).

Names given to people at the station are generally appropriate and are mostly worn with pride/honour... Nicknames last for many trips and can often be the only name one can recall (Z., 1990-94).

Use of peculiarly Antarctic jargon is handed down from year to year. Nicknames for all base personnel are used rather than real names (U., 1980-84).

Clothing, hairstyles & artefacts

Men referred to standard items of Antarctic clothing, including ventiles (windproof over-jackets), sheepskin hats, t-shirts, Mukluks (boots), beards & hairstyles and a variety of artefacts, including vehicles & photos, as symbols of the culture of Australian Antarctic stations. In general, those who travelled to Antarctica prior to 1980 also identified the dogs and the Sharpe ANARE naval knife as symbols of Antarctic station culture.

Typical responses by men included:

Beards, aspects of clothing - generally a bit tatty, oil stained & functional, the dogs, and rough language (F., 1960-64).

Beards, sunnies (sun glasses), hat (sheep skin) and yellow ventiles (A., 1995-99).

T-shirts, badges, cups: All embossed with logos and Mohawk hairstyles (X., 1995-99).

Photographs of wintering parties dating back to the early 1940's...seeing how things have progressed eg., clothing, buildings and women (D., 1995-99).

The Sharpe ANARE knife (naval style) is the biggest symbol...along with the great Antarctic silence (K., 1990-95).

Women identified similar symbols of station culture, but referred to these symbols as “male” in nature. It is of particular interest to note that women also identified “centrefolds”, “rumours” and “heavy drinking” as symbols of Antarctic station culture.

Comments by women included:

Photos of previous wintering parties - predominantly male; only female members since the late 80s with any regularity. Clothing is designed for men only eg., there are no small socks... Heavy drinking - the rumours (N., 1995-99*).

Boffin (Scientist), Bios (Biologists), Dieso (Diesel mechanic), Jolly (scientific trip away from the station), Ventiles (Antarctic clothing) (G., 1985-89*).

Bolos (Burnt out left overs - those who stay a winter and then stay on for another summer); Summerers/winterers - no good if you are a summerer; and boys have difficulty giving up the centrefold (B., 1990-94*).

Jargon - lots of acronyms (eg., wov = wanted on voyage) and ANARE words (eg., tradies, jollies, shed etc) are used both down south and back home by fellow expeditioners to convey a sense of shared experience. Certain sayings become popular down south but vary from year to year...they convey a sense of belonging to a group (J., 1995-99*).

Men and women identified a variety of symbols of Antarctic station culture of which reference to language was the most notable. Numerous examples of uniquely Antarctic acronyms, phrases and jargon were cited that provided expeditioners with a sense of belonging to ANARE and their individual station team.

Hairstyles, beards, clothing, vehicles and artefacts were also identified as symbols of Antarctic station culture. As in the case of language, the emergence of many of these symbols can be traced to the era of the early Antarctic explorers, though many also emerged as a result of changes introduced to Antarctic station lifestyle in the 1980s.

A striking feature of the symbols identified is their association with the pre-1980s all-male era of ANARE expeditions, including standard items of ANARE clothing, of which some are still only available in men’s sizes. No female symbols of station culture were identified and the origins of most symbols can be traced back to the early all-male era of Antarctic history.

2.4.2 Heroes and Legends

Participants identified a number of early Antarctic explorers and past expeditioners as Antarctic heroes or legends. These individuals were considered to possess characteristics highly prized by expeditioners and served as role models for behaviour.

Sir Douglas Mawson was the most frequently identified Australian Antarctic hero followed by Scott, Shackleton and Ninnis. In many instances participants qualified their choice by referring to the personal achievements and qualities of the individual.

Well known past Antarctic expeditioners were also frequently identified as heroes and legends, including "Chompers" Currie (1984-90) and Philip Law, the first Director of the Australian Antarctic Division. Chompers Curry was identified as a well-known and well-liked individual who participated in over 10 Antarctic expeditions. Philip Law was referred to as the most approachable and accessible Director of the AAD and was well respected for his personal contact with all expeditioners during his Directorship.

Typical responses by participants included:

Early explorers such as Douglas Mawson, Shackleton - bravery, hardship etc. that they experienced – they are much admired especially since the bases are now so luxurious. Also early ANARE explorers (J., 1995-99*).

Chompers Curry (11 expeditions)

Philip Law (longest and first serving Director) (A., 1995-99).

Russel Rachinger who was awarded an Antarctic Medal.. Philip Law: martinet and boys own hero....(W., 1985-89).

The dogs at Mawson - how travel used to be;

Old station at Casey - how people used to live;

Mawson (sir Douglas) - his achievements;

Phil Law - travelled to Antarctica in 1945 (D., 1995-99).

Neils Lied (pronounced leed) - Danish- made many trips to Antarctica

John Bechevais

Philip Law

George - the Storeman

Plus the original heroes - Scott and Mawson (P., 1960-64).

Dougie Mawson
Chompers Currie
Scott's expedition (C., 1975-79).

Critical aspects of Antarctic heroes/legends were highlighted by women, including the "male image" of Antarctic station culture and tendency for all heroes and legends to be men. Some women also suggested that recent male expeditioners identified heroes who were the wrong type of role models for behaviour:

It certainly seems to be the macho image, which is the lauded one - brave, heroic, 'Aussie male' behaviour (N., 1995-99*).

Wrong type of role model - drunks are legends....boys don't think that Antarctica is tough any more because girls can go there (B., 1990-94*).

The early Antarctic explorers were the most frequently identified role models and heroes of Antarctic station life by men and women in this study. Men, in particular, referred to the personal achievements and qualities of these early explorers and described events highlighting acts of bravery and hardship. More recent, popular Antarctic expeditioners were also identified as heroes and role models by men. In almost all cases these individuals were men who had wintered in Antarctica many times and were well known and liked. Interestingly, the Antarctic heroes referred to were associated with the pre-1980 all-male era of Antarctic station life and no women were identified.

2.4.3 Rituals

Participants identified several calendar events as socially essential occasions celebrated on all Antarctic and sub-Antarctic stations. These events include Christmas, New Years Day, Birthdays, Midwinter's Day, Midwinter's Dinner and the traditional Midwinter play. The events were referred to by almost all participants, including those who participated in the earliest expeditions to Antarctic and Macquarie Island in the 1950s.

Midwinter was first celebrated during Mawson's expeditions in 1912 and 1913 (Jacka and Jacka, 1988) and is a ritual that continues to be celebrated on all Antarctic stations today. The Midwinter play was referred to as a central part of Midwinter celebrations and traditionally, "Cinderella" was performed by expeditioners on each station, though occasionally some groups selected alternative plays (eg., "Snow white"). Other activities

identified as station rituals include the arrival and departure of ships, most notably the arrival of station wintering parties and the departure of summerers in March each year. Participants frequently referred to regular weekly activities, including Friday night drinks, movie nights, Saturday night dinners and the preparation of home brewed beer as key social events. It was of particular interest to note that one participant (Y) highlighted that the extent of celebrations (eg., birthdays) varied depending on the individual and the extent to which they “fitted in” to the group:

Midwinter is a day when the station personnel put on their finest clothes, eat a fabulous meal prepared by the chef to celebrate the shortest day of the year. The day is one of much gaiety, brightness and celebration and can be extremely emotional. It's always looked forward to (Z., 1990-94).

Midwinter Dinner - a very complicated affair. Ignoring the climate, the group closes ranks, tidies up and after a day of outdoor activities (usually with minimum clothing) sits down to three courses and pretends they're making history. Also, as in one year, an occasion for pointed subversion and the expression of deeply felt malice (W., 1985-89).

Birthdays are important but dependent on “how good a fit” (how well the individual fitted in). This question really depends on the group and community spirit (C., 1995-99).

Midwinter was the most important day of the year, followed by Xmas, Birthdays, Anzac Day, farewelling the traverse (crew that participated in trips away from the station, usually several days) and welcoming them back. Cooks resignation day (annually) to commemorate the cook that once resigned on a station and did no more cooking for the entire year (S., 1975-79).

- Head shaving
- Midwinter's Cinderella - boys dressing up as girls
- Fortnightly formal dinners
- Trip off station
- Australia day; Christmas; Birthdays
- Getting one over the Division is seen as a bonus eg., going on ice when they know they shouldn't
- Drunken tales of field trips (B., 1990-94*).

Midwinter's dinner - but it wasn't as big as it is now. There was no pantomime (Midwinter play), but some of the men dressed up as Nazi storm troopers that year (V., 1950-54).

Participants identified several rituals that characterise the culture of Antarctic stations. These can be categorised into three groups according to their social significance. The first group comprises international festive occasions celebrated in Antarctica and throughout the world (eg., Christmas, New Years Day, Birthdays and national days of various

countries). The second group comprises rituals unique to the Antarctic, including Midwinter's Day, Midwinter Dinner, the traditional Midwinter's pantomime or play, the arrival and departure of ships with incoming expeditioners, Saturday night dinners, and the preparation of home brewed beer. The third group comprises social activities common to many organizations, including Friday night drinks and movie nights.

Almost all events were celebrated annually by all Antarctic and sub-Antarctic station teams and most were referred to by all participants, irrespective of gender or the year of their expedition. However, it is of interest to note that some women identified some activities (eg., cross dressing for the Midwinter play, typically a performance of Cinderella by the group), as remnants of the all-male era of station culture, inappropriate today given the increasing number of women on stations¹⁹.

Participants' comments also highlighted a distinction between individuals who remain on a station for the summer only (summerers) and those who will live on a station for twelve months or more (winterers). For instance, some participants highlighted that winterers are much more respected by the wider Antarctic community because they live on a station for an entire year, compared to summerers who spend up to three months in the Antarctic and are generally viewed as short-term visitors to Antarctic stations.

2.4.4 Stories

Stories relating to rule breaking incidents, hardship and life threatening experiences circulated on all stations from the earliest Antarctic expeditions. Participants referred to stories that were passed on from year to year and also gave examples of stories that originated in recent years, during their own expeditions. Stories involving hardship and life threatening experiences were more frequently referred to by men who participated in expeditions during the 1950s, 1960s and 1970s. The men and women that participated in mixed expeditions during the 1980s and 1990s, typically referred to rule-breaking incidents and rebellion.

Comments made by the participants of expeditions prior to 1980 included:

¹⁹Interestingly, although the Midwinter play was regarded as a traditional station ritual, evidence (see comment by V above) suggests that the concept is not a tradition that dates back to the early explorers, but probably originated some time in the 1950s.

Humour and disaster eg., station fires, trapped in blizzards and escaping with frostbite. Loss of vehicles in sea ice and crevasses (F., 1960-64).

Some stories got around. Some were true. Gringo used to attach ropes to the tractor controls to stop the tractor from falling in a crevasse. He used to drive it from behind, holding the ropes. Once it actually got away from him...he fell in a crevasse but got jammed so we were able to pull him out...Another time we stopped and camped on a slope of ice overnight. We put up a tent. The next morning when we pulled the pegs out I looked closely and discovered that we had camped on a crevasse. There was no way of telling though at the time (T., 1975-79).

I took my motorbike there ... I tied a sled to the back and gave people rides..(P., 1960-64).

Typical responses by participants of expeditions from 1980 onwards included:

Some stories were legendary, some were new. We always knew about trouble on other stations though (A., 1995-99).

- Expeditioner deaths, esp. from people who were south when they happened.
- The Mawson dog runs and removal of the dogs - it upset past Mawson expeditioners.
- Stealth jollies - undertaken on the bases where the SL (station leader) was too strict.
- Casey 1996 winterers mutiny against the SL.
- Mawson 1997 winterers' problem with one of the women (J., 1995-99*).

Moral tale: the death of an expeditioner who got lost in a blizzard on the way to the latrine at Robertson's Ridge. Rule breaking: illicit raiding of the green-store (food and equipment store) for shopping expeditions (W., 1985-89).

Travel by trike up onto the ice plateau when it was completely forbidden. Classic rule breaking like driving a VW across the sea ice for 16 km before it sank (M., 1985-89).

Participants referred to a range of stories that circulated on all stations and were considered to be characteristic of the culture of Australian Antarctic stations. These stories relate to all aspects of station work and community life and incorporate humour, danger and conflict. They can be categorised as either rule breaking incidents, or moral stories involving, hardship, danger or death.

Men who participated in expeditions prior to 1980 typically referred to stories involving hardship or danger, whilst the stories told by men and women of more recent expeditions tended to focus on interpersonal conflict, group divisions and station management issues. This trend is of interest because it suggests an increase in the incidence of interpersonal conflict on stations in recent years, and a reduction in the occurrence of hardship and

physical danger brought about by the passage of time, and major developments in Antarctic station accommodation and technology from the mid 1980s onwards.

2.5 Values

Participants were asked to identify the key characteristics valued and sought by the Australian Antarctic Division (AAD) in expeditioners. Job competence, interpersonal skills and physical and mental health were identified as the key characteristics that expeditioners considered were sought by the AAD. However, a number of criticisms of the current selection and recruitment process were also made. In particular, some participants reported that too much emphasis was placed on occupational competence in favour of social and interpersonal skills, whilst others suggested that the current expeditioner screening procedure was ineffective and that new recruits were not adequately prepared or trained for the “real” culture of stations.

It is of interest to note that several participants referred to the existence of an “old boys” network, which resulted in a preference for re-selection of past expeditioners. Others suggested that for professions in which there were insufficient expressions of interest, most applicants were recruited because a full complement of personnel was the main objective of expedition recruiting.

Comments by men and women regarding the key values sought in expeditioners included:

There is the “Real” Antarctic culture and the “Ideal” culture. The Antarctic Division comprises former expeditioners who have a club approach so occupational expertise has preference over social applicability (L., 1990-94*).

- The best men in their trade or profession
- Ability to mix well
- Tolerance of others
- Adaptability (do others work)
- Initiative
- Perfect health (S., 1975-79).

The ability to put up with anything that goes wrong, and be able to improvise in order to get the job done (U., 1980-84).

Self-reliance and the ability to cope in Antarctica with conditions and people (F., 1960-64).

You have to be able to do your job well. You have to be able to get along with others. I was 24 when I first went down (T., 1975-79).

- Integrity
- Good at their job
- Competent
- Trustworthy
- Flexible
- Principled

However, what they need to look for is:

- Gregariousness
- A sense of humour
- People willing to take initiative and be capable of this (E., 1965-69).

Occupational competence. However the following are ideals, often ignored in favour of occupational competence when the choice has to be made:

- Social flexibility
- Respect for others
- Willingness to “pitch in “ to station life
- Self-confidence
- Independence (L., 1990-94*).

Who knows? In the case of the Doctors it seemed to be desperation, none of the good ones want the job. The old boys network is alive and well, regardless of their values, mates are selected (B., 1990-94*).

Until a few years ago, it was just all white Anglo Saxons and you couldn't go if you were a vegetarian (A., 1995-99).

Station culture and the espoused culture are two very different things.. Generally people got through the screening and then went and behaved in a way that was oblivious to the espoused culture or the Antarctic Division. The Division has probably just given up with people....people say the right things and then once they're there its all very different. The Division would prefer people willing to sit indoors, do their job and go quietly to bed. It (the Division) doesn't recruit and train adequately (W., 1985-89).

They look for highly motivated independent and skilled people and then place them in a very structured and restrictive environment (C., 1995-99).

Participants' responses to this question suggest that the values participants considered to be espoused by the AAD in expeditioners, differed from the values actually sought in new recruits. For instance, some participants highlighted that while job competence and interpersonal skills were espoused values, in reality job competence and previous Antarctic experience had ascendancy over social competence and all other attributes. Others suggested that the values sought by the AAD in expeditioners were ambitious and inappropriate given the real demands of Antarctic station life. Furthermore, several

participants expressed concern that expedition selection and recruitment was ineffective because individuals with poor social skills were frequently recruited and many expeditioners were unprepared for Antarctic station life.

2.5.1 Values not sought in expeditioners

Participants were asked to identify the key characteristics that would not be valued in expeditioners. A lack of interpersonal and people skills were frequently referred to by participants, irrespective of their gender or the year of their expedition to the Antarctic. Participants also referred to a range of behaviour problems on stations of which drunkenness was the most notable.

Typical comments by men and women included:

Aggression, intolerance, selfishness, laziness, alcohol or drug addictions/dependencies dishonesty, sense of escaping from problems at home, disregard for Antarctic and the environment, foolhardiness (J., 1995-99*).

Stirrers, loafers, drunks, bullies (A., 1995-99).

Drunks - they fail: The AAD fails to find the drunks before departure (D., 1995-99).

- Selfishness
- Humourless
- Unsociability (S., 1975-79).

...it doesn't take much more than one or two people to totally ruin a year. There are all sorts of instances where one dominant personality, aggressive and unpleasant, has totally ruined the year for other people (Z., 1990-94)

Antisocial behaviour and alcoholism were identified as the key characteristics that should be identified and screened-out in ANARE applicants. Interestingly, responses to this question highlighted that drunken behaviour was prevalent on stations because alcoholics were not screened out in the selection process. Participants frequently referred to the major impact of antisocial behaviour on group functioning and identified alcoholism, in particular, as an ongoing station problem that needed to be addressed.

2.6 The most salient aspects of Antarctic stations

When asked to describe the most salient aspects of Australian Antarctic stations,

participants commonly referred to the Antarctic environment with specific references to the Antarctic scenery and wildlife. However, a striking feature of responses was a recurring reference to social conflict, with responses varying according to the participant's gender and expedition year. For instance, women referred to the "maleness" of stations and "inappropriate behaviour", whilst men who wintered from 1985 onwards referred to "mob thinking", "the impact of alcohol consumption" and the excessive luxury of station accommodation.

Responses to this question by women included:

- Maleness
- Tradition
- Willingness to pull work together whenever required
- Inequity
- Superficial social bonding
- Camaraderie (N., 1995-99*).

- Multi-disciplinary work team
- Remote and isolated location
- Male dominated culture
- Occupational values tend to have ascendancy over social values

Residual influence on values of outmoded heroic era culture - now moderately irrelevant in view of the realities of work and social life on stations eg., modern communication and standard of living (L., 1990-94*).

Comments made by men who participated in more recent expeditions include:

The social aspects - i.e. they're totally different to the Australian environment - both for work and play (X., 1995-99).

Coastal views are spectacular.

My initial impression of Mawson was the best.

The stations look very comfortable - solid, windproof accommodation.

A feeling of freedom (A., 1995-99).

Material luxury in excess of that enjoyed by most expeditioners at home and individual isolation uncompensated by the artificial community. Peculiar, self destructive, inconsiderate individual performance. The security offered by mob thinking and alcohol (W., 1985-89).

In comparison, the men who wintered in all-male expeditions prior to the 1980s were more likely to refer to "camaraderie" and the "isolationist" nature of station lifestyle,

though references to social friction were also evident in their comments:

The feeling of isolation from people. That you're 200 km from the nearest station...the feeling of knowing everyone on station really well...their walks, their snoring, and their noises. You see them all the time, everyday, whether you wanted to or not...you forget differences because you need each other...you couldn't walk away, you would see them (other expeditioners) constantly and would be exposed to their (bad) habits all the time. (S., 1975-79).

The small size of the station... The camaraderie. The opportunity to work and learn about the place, the people and the type of work carried out (P., 1960-64).

Coping with the impact of the isolationist nature of the expedition lifestyle, with the likelihood of not seeing faces of others, other than those at the station, for more than a year. An exception was a visit to the base by a group of Russians -fresh faces were most welcome (Y., 1965-69).

The isolation and the profound affect that the behaviour of individuals can have on the group as a whole (U., 1980-84).

The most salient aspects of Antarctic stations comprised positive and negative aspects of Antarctic station life. Positive aspects comprised the physical Antarctic environment, and for those who participated in the earliest expeditioners to the Antarctic, social aspects of station life, including friendships, camaraderie and team work. Negative aspects of Antarctic station life comprised interpersonal conflict and group tension.

Participants' comments also revealed gender differences in responses to this question. In particular, women referred to the male dominated image of stations, whilst men who participated in expeditions from the mid 1980s onwards referred to social problems, including drunkenness and disappointment at the level of luxury of station accommodation. Interestingly, the responses of men who participated in the earliest expeditions contained fewer references to social problems or negative aspects of station life, suggesting that perceptions of station life may improve with time, or alternatively, that the prevalence of social conflict on stations may be increasing.

Perhaps the most notable feature of responses to this question was a recurring reference to the two themes previously identified in comments to the first two questions of the interview schedule: (i) reference to the physical Antarctic environment - the best aspect of the Antarctic experience; and (ii) reference to the social demands of station life - the

worst aspect of the Antarctic experience.

2.7 General Discussion

This investigation explored the culture of Australian Antarctic stations. It identified individual elements of Antarctic station culture, including symbols, heroes, rituals, stories and values, and the characteristics required for good “fit” into Antarctic station life. The investigation also identified: (i) two distinct eras of Antarctic station culture; (ii) discrepancies between the values expeditioners considered to be espoused in new recruits and the behaviour norms of Antarctic stations; and (iii) a number of social issues integral to the functioning of Antarctic stations as social systems.

Participants identified the Antarctic environment as one of the best aspects of their experience and the reason they would recommend the Antarctic to their friends as a good place to work. However, a series of recurring social issues dominated responses to all other questions including:

- gender discrimination;
- the effects of alcohol;
- professional animosity;
- the ascendancy of occupational competence over social competence in expeditioner screening and recruitment; and
- the residual influence of the early all-male era culture on Antarctic station life today.

These social issues were identified as one of the worst and most salient aspects of the Antarctic experience. When asked to explain how the culture of Antarctic stations could be improved, participants frequently highlighted the need for improvements to the social functioning of stations through better gender representation and changes to the expeditioner selection and screening program. Many participants also highlighted that increasing supplies of liquor were threatening the social fabric of Antarctic stations. The extent to which these issues are addressed will determine the degree to which Antarctic station culture changes.

A recurring and pervasive theme in participants’ comments to the interviewer that transcended the scope of the interview schedule, was the changing nature of station

culture. In particular, this study revealed four sources of major “change” to Antarctic station culture since the 1950s comprising: (i) technological advances in communication; (ii) large-scale changes to station buildings; (iii) the increasing number of construction workers during station rebuilding; and (iv) the recruitment of women. These events had major impacts on Antarctic station life and culture, particularly from the early to mid 1980s, and may account for some of the observed variations in the comments made by those who participated in all-male expeditions prior to the 1980s, and those who participated in mixed gender expeditions from the mid 1980s onwards.

The results also suggest that this investigation covered two distinct eras of station culture: the all-male era of ANARE up to 1980, and the two decades of mixed expeditions from 1980 onwards. In many ways, these two distinct eras may reflect administrative, logistic and recruitment changes to ANARE. In particular, whilst in the first few decades after its establishment ANARE was closely linked to the Australian Armed forces with servicemen and ex-servicemen frequently recruited in expeditions, by the 1970s these practices changed and ANARE recruitment began to follow Australian Commonwealth public service practices. Station leaders replaced Officers in charge, and ANARE infrastructure began to support other Australian government agencies, including the Bureau of Meteorology (BOM) and the Commonwealth Scientific and Industrial Organization (CSIRO), and research links with Australian Universities were established.

Consistent with this notion is the observation that responses to questions on station culture varied according to participants’ gender and the year of their expedition. For instance, men who participated in all-male expeditions prior to the 1980s were frequently sceptical about the recruitment of women expeditioners and argued that changes or improvements to Antarctic station culture were not required. Men and women of mixed gender expeditions from the mid 1980s onwards, on the other hand, were much more receptive to the need for change and frequently referred to the need for: (i) a better mix of men and women on stations, (ii) improvements in expeditioner selection and recruitment, and (iii) measures to overcome sources of social conflict on stations.

In terms of station leadership, “good people skills” typified “good station leadership”. A good station leader was frequently described as honest, fair, consistent, approachable and

able to strike a balance between being a leader and a friend. Also of interest was the implicit and explicit reference to good station leaders as “men” with distinguishing leadership skills (eg., “a leader of men”, “one of the boys” and an expeditioner with good “man management skills”). This is particularly interesting given the fact that women have been recruited as station leaders since 1988.

The results of this study revealed that good station “fit” required certain individual characteristics and social skills. In particular, expeditioners considered to “fit in” were described as “team-oriented”, “even-tempered”, “flexible”, “sociable”, “tolerant” of the behaviour and habits of others and able to avoid conflict. An individual’s failure to “fit” into the context of station life was attributed to a lack of adequate social skills rather than job skills, and was considered symptomatic of the ascendancy of occupational competence over social competence in screening and recruitment practices. This finding has serious implications for ANARE selection and recruitment for three reasons. First, this study has provided evidence for the importance of social competence as well as occupational competence for good “fit” into Antarctic station life and culture. Second, recurring reference to “better” and “more careful selection of expeditioners” constitutes evidence that ANARE selection and recruitment procedures need to be reviewed and changed. Third, previous research has confirmed that in the Antarctic, psychological adjustment and social compatibility are as important as occupational competence (Biersner & Hogan, 1984; Rothblum, 1990).

In this study individual elements of Antarctic station culture, including symbols, heroes, rituals, stories and values, were identified. Both men and women referred to a variety of symbols of Antarctic station culture of which language was the most notable. Numerous examples of uniquely Antarctic acronyms, phrases and jargon were cited that can be traced back to the 1950s and 1960s and continue to be used across all stations today. Other symbols of Antarctic culture identified include: hairstyles, beards, clothing, vehicles and artefacts that, as in the case of language, can be traced back to the 1950s and in many ways reflect the residual influence of that era of Antarctic history on station life today.

Interestingly, the early Antarctic explorers were the most frequently identified role models and heroes of Antarctic station culture, though critical aspects of Antarctic heroes and legends were also highlighted, particularly by women who referred to: the “male image” of station culture; the “maleness” of Antarctic station symbols; and the tendency for all heroes and legends to be men. In view of women’s comments on the maleness of Antarctic stations and gender discrimination, and recurring reference to the need for “more women” on stations by men and women who participated in mixed gender expeditions from the 1980s onwards, further research on women on stations is needed to further explore: (i) the social problems confronting women on stations; (ii) issues relevant to the “fit” of women into Antarctic station life and culture; and (iii) the implications for ANARE selection and recruitment.

This investigation also explored the extent to which rituals were characteristic of the culture of Antarctic stations. Participants identified several rituals that helped to bind members of expeditions together as work colleagues and as members of small isolated communities. These rituals can be categorised as: (i) international festive occasions celebrated in Antarctica and internationally (ii) rituals unique to the Antarctic and sub-Antarctic, including Midwinter’s Day, Midwinter’s Dinner, the traditional Midwinter play, and the arrival and departure of expeditioners, and (iii) social activities common to many organizations, including Friday night drinks and movie nights.

Participants’ comments revealed that a range of stories circulated on stations that were considered to be characteristic of the culture of Australian Antarctic stations. These stories related to all aspects of station work and community life and comprised: (i) rule-breaking incidents; (ii) moral stories involving, hardship, danger or death; (iii) and incidents relating to past or current Australian Antarctic expeditioners. Although examples of all types of stories were provided by participants, those who travelled to Antarctica prior to 1980 typically referred to stories involving hardship or danger, whereas the men and women of more recent expeditions tended to refer to stories that focused on interpersonal conflict and station management issues.

Job competence, interpersonal skills and physical and mental health were identified as key values that expeditioners considered were espoused by the AAD. However, men and

women referred to discrepancies between espoused AAD values and the values actually sought, which form the basis of underlying assumptions and have important implications for expeditioner selection and recruitment. For instance, participants highlighted that although they assumed antisocial behaviour was identified and “screened out”, drunkenness and sexual discrimination and harassment were prevalent on stations and threatened station harmony. Furthermore, participants identified the characteristics that should be screened out of ANARE recruits, including “drunkenness”, “aggression”, “bullying”, “selfishness” and “unsociable behaviour”.

In summary, the comments of participants in this study revealed that the most salient aspects of Antarctic stations comprised the Antarctic landscape and wilderness, as well as a series of social issues relevant to Antarctic station life and culture. The most prevalent social issues identified were: (i) the impact of interpersonal conflict on station functioning, particularly gender discrimination; (ii) the need for improvements in screening to ensure that antisocial behaviour and alcoholism are screened out and a better balance of both job and social competence are screened in; and (iii) the residual influence of the early all-male era of Antarctic history on station culture today.

CHAPTER 3

Study II

3.1 Introduction

This chapter presents the results of a qualitative study on the attitudes and experiences of women toward Antarctic station life and culture. The decision to undertake this study was threefold. First, in view of the results of the previous study, and the increasing number of women being recruited in Australian National Antarctic Research Expeditions (ANARE), a better understanding of the issues confronting women on Australian Antarctic stations is needed. Second, given the small group of women interviewed in the previous study, a follow-up investigation comprising a larger sample of women is needed to further explore the extent of “fit” of women into Antarctic station life and culture.

Available scientific research on women in the Antarctic is limited to a few North American studies, including a study of 4 US women who skied to the South Pole (Kahn and Leon, 1994), and a study of 36 US women scientists and field team members who participated in US Antarctic expeditions (Rothblum, Morris, Weinstock, 1995;1998). Australian research on women in the Antarctic comprises Elizabeth Chipman’s historical account of the first women expeditioners “Women on Ice” (1986), a second more recent historical account of women’s participation in ANARE (Burns, 2001), a chapter of Tim Bowden’s “The Silence Calling” (1997) and a study of the pursuits of women scientists (Burns, 1996). Published scientific research specifically on women within the context of Australian Antarctic station life does not exist.

Despite the increasing emphasis on mixed gender ANARE expeditions since the 1980s, and the importance of effective expeditioner selection and recruitment, social and behavioural research is not a priority research area within the scope of the Australian Antarctic research program and is categorised as “non-core research” that is less relevant to the government’s key goals and priorities for the region (ANARE Science Strategic Plans 1995-2000).

3.2 Method

3.2.1 Participants

The participants were 14 women who were returned ANARE expeditioners based on an

Australian Antarctic or sub-Antarctic station between 1985 and 1999²⁰. It was a mixed age group with ages ranging from 30 - 52 years. The group comprised nine women who lived and worked on an Antarctic station between 12 and 15 months, including an Antarctic winter (referred to as “winterers”) and five women who lived and worked on a station for up to three months over summer (referred to as “summerers”). The women volunteered to take part in the study. Five women were identified through a process of networking in which each was asked to nominate and contact another expeditioner about the study, and nine responded to an advertisement calling for volunteers to participate in a study on “Australian Antarctic station life”²¹. The advertisement was published in “Aurora”, the journal of the ANARE Club of Australia. At the time of the study the women lived across five Australian States, including South Australia, Victoria, Tasmania, New South Wales, Queensland, and the Australian Capital Territory (ACT).

Most women had only participated in one expedition to the Antarctic; however, the number of expeditions ranged from one to three per person. The group included station leaders, medical practitioners, chefs, scientists, researchers, and meteorological and communications personnel. In terms of their educational background, the women were highly educated; 11 had University degrees and two women had technical diplomas or certificates. Table 3.1 contains basic demographic information, including age, station positions and the year of their last expedition to the Antarctic. Appendix C1 contains additional demographic information.

Table 3.1: Demographic information for Study II

	N
Station Position	
Station leader	2
Medical Doctor	2
Scientist/Researcher/Field assistant	6
Meteorological technician	1
Communications technician	1
Chef	2
Expedition Year (last)	
1985-89	3
1990-94	4
1995-99	7
Mean Age (in years at time of interview)	39.79
standard deviation	6.33

²⁰In this study the sub-Antarctic comprised Macquarie Island only. References to “the Antarctic”, “Antarctic stations” and “Antarctica” will hereinafter also include Macquarie Island station.

²¹The five women were the same women used in the previous study (Study 1). The remaining nine women were additional participants.

3.2.2 Procedure

Each woman completed the semi-structured interview schedule used in the previous study and outlined in section 2.2.2.²¹ The interview was sent to women living outside South Australia. All women were asked to provide a written response to each question and encouraged to further discuss their responses with the interviewer. Women living outside SA were asked to contact the interviewer by telephone if they had any queries. Table 3.2 contains the interview schedule questions. Other sources of data included letters and relevant newspaper articles forwarded to the interviewer by participants.

Table 3.2: Interview schedule questions for Study II

-
- Describe the best aspect of your experience in Antarctica.
 - Describe the worst aspect of your experience in Antarctica.
 - Would you recommend the Antarctic to your friends as a good place to work? Why?
 - Imagine that a close friend was interested in going to Antarctica as an expeditioner. If he/she asked you what they required to fit in to the culture of Antarctic stations, what advice would you give?
 - If they asked you what is required in order to be a good station leader, what advice would you give them?
 - How could the culture of Antarctic stations be improved?
 - In your view, what are the most salient aspects of Australian Antarctic stations?
 - What are the key characteristics valued and sought by the Australian Antarctic Division in expeditioners?
 - What are the key characteristics not valued or sought by the Division in expeditioners?
-

3.3 Results and Discussion

The analytical framework emerged from the interview questions and the themes from participants' responses. Qualitative research methods outlined by Richard Krueger (1997) and Miles and Huberman (1994) were used to facilitate data analysis and the categorisation of themes. The analysis identified two recurring themes around which responses were framed: (i) the natural Antarctic environment; and (ii) the culture of Antarctic stations. A summary of participants' responses and the themes identified is

²¹The questions were not prepared specifically for women since the same questions were administered to men and women in the previous study.

presented below.

The information contained in parentheses includes an initial, the year of the participant's last expedition to Antarctica and the asterisk indicates that the participant was a woman. To maintain confidentiality, the initial was randomly assigned, although consistent across responses. Expedition year is represented in five year categories, and any other identifying information has been removed.

3.3.1 The natural Antarctic environment.

When asked to describe the best aspect of their experience in the Antarctic, every woman referred to the natural Antarctic environment; the weather, the ice, the scenery, the wildlife, and the opportunity to witness Antarctic seasonal change. Women also referred to the opportunity to get away from the station for personal reflection and to explore the environment. Four women referred to the natural Antarctic environment and the sense of adventure associated with going to the Antarctic as the reason they would recommend the experience to friends as a good place to work, whilst three women referred to the privilege of sharing the experience with their husband/partner who wintered with them:

Experiencing the natural Antarctic environment throughout the seasons, including weather, landscapes, birds and animals. Exploring the natural environment - skiing, camping, climbing, going for trips to the huts (H., 1995-99*).

The opportunity to fly by helicopter over some of the most fantastic scenery I've ever seen and be one of the few to have done it. I adore looking at the ice textures and learning about science in a place so inhospitable to most life forms...It is uplifting to experience and very exciting to see the ice, auroras, wildlife etc. (R., 1995-99*).

Experiencing the natural environment in all its moods and seasons and sharing this with my partner (E., 1995-99*).

Getting to view the scenery and wildlife for myself as opposed to just looking in books and watching videos...and being able to share the whole experience with my partner (Y., 1995-99*).

...the most enjoyable Antarctic experience was living with minimal need for money and seeing the colours of the icebergs change in the evening (I., 1985-89*).

Women identified the Antarctic environment as the highlight of their experience and the reason many would recommend the Antarctic to friends. Whilst references to the Antarctic environment were also made by men in the previous study, from a thematic

perspective it is interesting to note that in identifying the highlights of their experience women, unlike the men who participated in ANARE expeditions prior to the 1980s, made no references to the social aspects of Antarctic station life. This omission is of particular interest given that social aspects of Antarctic station life and culture were the focus of most other responses to the interview schedule.

3.3.2 Antarctic station culture

When asked to describe the worst aspect of their experience in Antarctica, women referred to the social norms and values of expeditions and a range of issues, including: (i) the male dominated nature of station culture; (ii) the prevalence of sexual harassment and discrimination; (iii) the prevalence of friction between scientists and trade workers; and (iv) the lack of anonymity associated with living and working with the same group of individuals, mainly men, for 12 months or more. In one particular instance, a participant suggested that sexual harassment was so prevalent that she would warn women interested in going to the Antarctic to be prepared for harassment.

Typical comments included:

How do I answer? ..with my mind on the people who went about their business and tried to get through what the Antarctic Division described as one of the worst years? or do I answer with my mind on the group of guys who found my presence in Antarctica so confronting that five or six of them banded together to try and take away my self-esteem? (X., 1985-89*).

Appalling personal confrontation with sexism and sexual harassment... (L., 1990-94*).

What I privately refer to as the "building site mentality". The narrow-minded view that if I, as a female, was talking to someone I must be sleeping with them. I never felt I was judged by how competent I was (as) a comms (communications) officer but instead on my apparently numerous liaisons (X., 1985-89*).

The constant harassment on station by a small group of male expeditioners (H., 1995-99*).

Some of the expeditioners' attitudes and behaviours. Having to compromise my integrity to maintain harmony (B., 1990-94*).

Too much attention from men on station, particularly during my first summer (1990s) - lots of gossip by men behind female expeditioners' backs regarding who they might be sleeping with etc; jealousy from tradesmen regarding the amount of time spent out in the field by scientists (J., 1995-99*).

The confinement to a small space/station limits, the ability to socialise with anonymity. I worked in a kitchen completely exposed and in view of all others, with the knowledge that all my actions ...were so exposed.... Tolerance at times was really stretched..(E., 1995-99*).

When asked to identify the most salient aspects of Australian Antarctic stations women again referred to the male image of stations and the prevalence of a “boys club” culture, that some suggested, rejected diversity and female values and traits. Five women highlighted that despite the fact that the principle objective of ANARE expeditions was scientific research, the social environment of Antarctic stations resembled a working class pub (bar) rather than a research environment:

There are a variety of types, but a “boys own” attitude predominates and sexism abounds, although most perpetrators would be totally unaware of how sexist their attitudes are. Predominant social norms are typically bar-room middle class/working class Australia and there is a subtle distrust of, or discomfort with, anyone who is a little different, be it with music, dress, diet, interests etc (E., 1995-99*).

It is a “boys club” - female characteristics, traits and values are not welcome here (especially if it is a male who has them)...Things change from year to year and station to station and it is hard to generalise, though a lot depends on the values of the station leader (A., 1995-99*).

Systematic harassment of one or more expeditioners, often female but not necessarily, often non-athletic, younger or effeminate men. This seems to serve as a “bonding” mechanism with the rest of the expeditioners who then have a mutual “enemy”. This seems to be encouraged by the AAD as this group then becomes a united power on station which can support the Station Leader (H., 1995-99*).

“Antarctic stations are for the boys”....the question is why do they exist -for science or for possession? (B., 1990-94*).

It seems more of a building site/hotel than a station for science purposes. There seems to be so much drinking and boy’s gossip that the most important concerns are missed (X., 1985-89*).

They (the stations) are too big, requiring more maintenance personnel than scientists...(R., 1995-99*).

In describing the worst aspect of their experience in Antarctica women frequently referred to experiences of sexual harassment and discrimination, irrespective of their station position or the year of their expedition. In particular, several women referred to the feeling that their social behaviour was under constant observation and that their social interaction with men was typically perceived as sexual by other men on the station. In

view of the marked under-representation of women, particularly in wintering expeditions, the impact of harassment and discrimination on the women who wintered was exacerbated because many felt alone and unsupported.

Women identified the male dominated culture of Antarctic stations as the most salient aspect of Antarctic station life. Their comments also suggest a possible link between gender based problems on stations and professional animosity, particularly between scientists and trade workers; women were usually highly educated scientists or researchers whilst the perpetrators of sexual harassment were almost invariably trade workers with few post secondary qualifications. Further, given their under-representation in a male dominated culture, women on stations were often isolated and judged as “outsiders” to the dominant group culture.

Values

When women were asked to identify the key characteristics valued and sought by the Australian Antarctic Division (AAD) in expeditioners, job competence was the most frequently mentioned value. Women also identified a number of social values and skills considered relevant for “good fit” into station life, including job flexibility, being easygoing, team-oriented, and trusting. It is interesting to note that several women distinguished between the values espoused by the AAD for ANARE expeditioners and the values people required. Two such responses included:

- Ability to keep mouth shut no matter what
- Ability to avoid conflict at all cost
- Ability to change and be flexible
- Ability to accept and tolerate racism, chauvinism, discrimination, favouritism and alcoholism (A., 1995-99*).

- Tolerance to the point of relinquishing legal protection against harassment & violence
- Not making a fuss - accepting anything without complaint
- Drinker (H., 1995-99*).

When asked to identify the characteristics not valued or sought by the AAD in expeditioners these women made the following comments:

Collaborative, vocal, honest, openness, communication skills (A., 1995-99).

- Knowledge and understanding of gender/harassment issues and legal rights in relation to them
- Non-drinker
- Female gender especially with assertiveness (H., 1995-99).

In relation to the recruitment of alcoholics a station leader made the following comment:

Known drunkenness or drug dependency - very little else. I advised the Division about my concerns with some expeditioners prior to departure and was told that I was probably right, but that it was too late. They (expeditioners) subsequently caused major disruption (B., * year has been omitted for confidentiality).

Consistent with the results of the previous study, the above comments highlight that social problems, most notably alcoholism and gender based discrimination and harassment are prevalent in many mixed gender expeditions. Comments also suggest a possible dichotomy between the key values espoused by the AAD in expeditioners, and the values actually sought since, in reality, the characteristics assumed to be screened out from new recruits, such as alcoholism, and sexist behaviour, are so prevalent that they are often considered to be the social norm. Consequently, women and non-alcoholics represent minority groups because their characteristics and values deviate from those of the dominant male culture.

“Fitting in” to Antarctic station culture

Women were asked: *Imagine that a close friend was interested in going to the Antarctic as an expeditioner. If he/she asked you what they required to “fit in” to the culture of Antarctic stations, what advice would you give?* A number of personal attributes were identified, including tolerance, patience and open-mindedness. A striking feature of responses to this question, though, was the frequency to which women identified different attributes for men and women:

Typical responses to the issue of “fitting in” included:

- Tolerance, ability to appreciate differences in each other
- You need to see good/benefits in someone or groups of workmates you’d not necessarily socialise with/like/seek out in society
- Desire to learn about others jobs in the field/on station (E., 1995-99*).

Keep your mouth shut especially if you are a female (A., 1995-99*).

Enjoy macho drinking culture, racist and sexist behaviour and be physically and mechanically able (H., 1995-99*).

If it was a man I would say an outgoing personality was an asset - for a woman it is certainly a huge liability! Younger, well travelled, outdoor people who were single seemed to come though unscathed in our year (X., 1985-89*).

(For women) be prepared to be a bit disappointed/don't expect too much of the calibre of your fellow expeditioners - don't wear your heart on your sleeve, participate to a degree in the bar-life if you will, but maintain your own integrity and interests. I think "fitting in" is less an issue perhaps even counterproductive in current popular behaviour than emotional/ethical maturity and responsibility, so I would always promote these above the superficial notion of fitting in with a group (E., 1995-99*).

Responses to the question of what one requires in order to "fit" into the culture of Antarctic stations were organised around the notion that in order to "fit in", expeditioners needed to tolerate sexist behaviour and excessive drinking. Interestingly, this is consistent with comments made by men in the previous study, highlighting the need for women to be prepared for confrontation on Antarctic stations. The results also suggest that given the prevailing male dominated workers' culture on stations, in many instances women were unlikely to "fit in" at all. Participants' comments suggest that rather than "fitting in" to Antarctic station culture women needed to possess personal attributes that enabled them to successfully carry out their duties within the context of the existing culture. These included job competence, and a range of personal traits such as emotional maturity, patience and tolerance. Moreover, women in this study distinguished between personal traits appropriate for men and women.

Cultural change

When asked to explain how the culture of Antarctic stations could be improved, women referred to the need for changes to expeditioner selection and recruitment. In particular, women referred to the recruitment of an even mix of men and women and the screening-out of alcoholics. Some women referred to the need for an even distribution of scientists and trade workers, whilst others suggested that more emphasis should be placed on the development of a culture that accepts diversity, rather than one that promotes antisocial behaviour.

Responses to this question by women included:

Change the people at the Antarctic Division doing the recruitment. If the “boys club” is recruiting, what will they recruit? The token women on panels are too scared to stand up and say anything (A., 1995-99*).

...the main thing I would advise is to aim for a larger number of women, so that the population is closer to the “real world” (I., 1985-89*).

More stress on acceptance (not just tolerance) of diversity

Debunking of the “boys own” Antarctic hero mentality.

Discourage multiple returning expeditioners (eg., 5-6 trips) - these are often the least flexible and most set in their ways (E., 1995-99*).

Personally, I believe a counsellor/harassment officer is required on station for expeditioners who need to talk about their problems and have no avenue for it..(R., 1995-99*).

1. Increase the number of women so that male-female ratio is close to equal;
2. Exclude problem drinkers; and
3. Educate station leaders, deputies and heads of department in gender issues and insist they enforce Commonwealth Government regulations regarding harassment and equal opportunity and support them to do so (H., 1995-99*).

1. From my point of view, a better mix between “boffins” (scientists) and support staff, particularly during briefings;
2. Maybe mention just why science is important (it’s the reason for anyone being down there); and
3. Explain how volunteers and scientists outside the AAD don’t get paid for common duties (on stations) yet are happy (hopefully) to carry them out (O., 1990-94*).

When the ratio of scientists to tradesmen comes closer to being even, the people will be concerned with things that really matter...(X., 1985-89*).

Women’s responses were dominated by references to the need for improvements to expeditioner selection and recruitment. In particular, women identified a number of outcomes that would improve the social functioning of stations, including: (i) an end to the “boys club” image of Antarctic expeditions; (ii) equal representation of men and women on ANARE selection panels; (iii) the recruitment of an even mix of men and women on all Antarctic stations; (iv) effective “screening-out” of alcoholics; (v) effective handling of ethical and Equal Employment Opportunity (EEO) issues, including complaints of workplace harassment; and (v) ensuring that all personnel are advised that Antarctic science, rather than building construction and maintenance, is the primary purpose of ANARE expeditions.

3.4 General Discussion

This investigation explored the attitudes and experiences of a group of 14 women toward Antarctic station life and culture. The group comprised returned ANARE expeditioners who were stationed in the Antarctic between 1985 and 1999, and included medical practitioners, station leaders, scientists and researchers, chefs and technical personnel. There were no trade workers in the group. Trade workers, including carpenters, electricians, plumbers, diesel mechanics and builders, apart from a few rare exceptions, have always been men.

The results highlight a series of recurring social problems that need to be addressed in order to: (i) improve the functioning of expeditions as social systems; and (ii) ensure that Antarctic stations are run in accordance with government regulations on EEO and workplace harassment and discrimination. In particular, the problems identified include:

- the prevalence of a male dominated workers culture;
- sexual harassment and discrimination of women;
- group friction between scientists and trade workers;
- drunkenness; and
- an obvious discrepancy between espoused ANARE values and the values expeditioners require in order to “fit” in to the prevailing culture.

References to the male dominated “building site” image of station life were a striking feature of women’s comments throughout this investigation. Comments suggested that in order to “fit in” to station culture expeditioners needed to be men, ideally tradesmen who enjoyed drinking and tolerated drunkenness and inappropriate social behaviour in others.

Although a male dominated culture per se may not necessarily be a problem in an all-male environment, its existence within the context of Antarctic stations is contentious for three reasons. First, following the introduction of women to Antarctic stations some 20 years ago, the all-male era of ANARE expeditions ended, at least officially, and expeditions have comprised of mixed groups for over two decades. Second, ANARE expeditioners are required to live and work together on stations and hence, the prevailing culture is not confined to the work place, but impacts on all aspects of an individual’s social life. Third, scientific research is the principal goal of Australian Antarctic expeditions, and although

women are rarely recruited as trades personnel, they are well represented in science and other professions relevant to ANARE. Despite this, however, the ratio of women to men in wintering teams at best is 1:8.

Consistent with the results of the previous study, this investigation highlighted the prevalence of a series of other recurring social problems on stations, including alcoholism, sexual harassment, sexual discrimination and professional animosity. The issues were identified by most women in this investigation irrespective of expedition year, and in terms of gender based problems. There is no evidence that Antarctic station culture has changed since the mid 1980s. The results of this study also suggest a link between professional animosity and gender based problems on stations from the 1980s onwards. For instance, whilst the previous study identified rifts between scientists and trade workers in expeditions as early as the 1950s, following the introduction of mixed gender expeditions in the 1980s, professional animosity was compounded by gender based problems between women and trade workers on stations.

The results point to the existence of a male dominated “pub culture” on Antarctic stations in which trade workers, who represent most dominant professional group, define group norms and values whilst women, and to some extent scientists, remain the “outsiders” because they are less likely to “fit into” the dominant male workers culture²² (Becker, 1973). Moreover, evidence suggests that following the commencement of the station rebuilding program in the 1980s, social problems on stations were exacerbated as the focus of expeditions shifted from Antarctic research to building construction and maintenance, and this shift in focus impacted on the composition of stations and all aspects of Antarctic station life and culture.

The results suggest that existing social problems on stations reflect the two competing interests of Antarctic science and building maintenance. The problems also reflect the two conflicting interests of cultural preservation of the early all-male era of ANARE and cultural change. These competing interests are likely to account for: (i) identified discrepancies between the values expeditioners considered to be espoused in new recruits, and the behaviour norms of Antarctic stations; (ii) the existence and maintenance of a

²²According to the sociological view advanced by Becker (1973), the term outsiders refers to individuals judged to stand outside the circle of the dominant group.

“building site” pub culture on stations since the 1980s; (iii) the prevalence of behaviour problems, including alcoholism and drunkenness on stations; (iv) evidence that current selection and recruitment practices do not adequately screen expeditioners for alcoholism and behaviour problems; and (v) the perception by expeditioners in this and the previous study that more emphasis is placed on building construction and maintenance than science as the primary purpose of ANARE.

In summary, the results of this investigation highlight the extent to which cultural change is needed in order to improve the social functioning of ANARE expeditions as multi-disciplinary government funded research teams, and the extent to which the “low priority status” given to social and behavioural research within the scope of the Australian Antarctic research program needs to be re-assessed. In particular, the results suggest that a process of managed change may be necessary to change Australian Antarctic station culture in order to ensure that cultural elements considered detrimental to the social functioning of stations are ‘unlearned’ and those considered desirable are enhanced. Ideally, managed change needs to be instigated by organizational leaders and management and a new direction and a new set of assumptions need to be articulated. A process of managed change may involve a number of strategies, including old symbols, rituals and myths that preserve dysfunctional traditions being discredited as new symbols, rituals and stories are created around new cultural values, norms and assumptions (refer to the section on Cultural Change in Chapter 1 for additional strategies that may be used).

CHAPTER 4

Study III

4.1 Introduction

This chapter presents the results of a study investigating the quantitative assessment of Antarctic station culture, and the notion of person-culture fit within the context of Australian Antarctic station life.

Research has found that culture can be an important factor in determining how well an individual will fit in an organization, and organizations dedicate a substantial amount of their resources to establishing and maintaining “good fit” between individuals and their jobs. The assumption is that irrespective of their job skills, certain people are better suited to work in some organizations than others (Caldwell and O’Reilly, 1990; Chatman, 1991). Previous research on person-culture fit has highlighted that “good fit” increases job commitment, job satisfaction and performance (O’Reilly et al., 1991). Chapter 1 contains a detailed outline of research on person-culture fit.

In this study person-culture fit will be assessed in terms of the congruence between perceived Antarctic station values and individuals’ preferred values. Values are a fundamental part of most definitions of organizational culture, and theoretical and empirical research on culture suggests that values congruence is a meaningful way of measuring the extent to which an individual will fit into an organization (Chatman, 1989, 1991; Schein, 1990; O’Reilly et al., 1991; Cable and Judge, 1996). Values are defined as enduring beliefs that guide people’s behaviour, attitudes and judgments. Within the context of an organization, value systems provide elaborate and generalised justification for appropriate member behaviour and the activities and functions of the entire system (Enz, 1988; Chatman, 1991). Organizational values are considered a group product and individual elements of an organization’s culture (e.g., symbols, heroes, rituals and stories), revolve around an organization’s value system (Schein, 1985; O’Reilly et al., 1991).

Past theoretical and empirical research (eg., Schneider’s (1987) attraction-selection-attrition model) suggests that job seekers base their fit perceptions on the alignment between their values and those of organizations. Research has also demonstrated that objective fit predicts subjective fit perceptions (Chatman, 1989; Cable and Judge, 1996). However, this research has largely been concerned with organizational fit in business

settings; demonstrations of its application and relevance in isolated and remote organizations is lacking.

This study will examine the role of person-culture fit within the context of isolated and remote Australian National Antarctic Research Expeditions (ANARE). The study will identify the congruence between perceived Antarctic station values and preferred individual values using the Organizational Culture Profile (Chatman, 1989; O'Reilly et al., 1991). It will also determine the extent to which values congruence affects expeditioners' (i) subjective fit perceptions; (ii) job satisfaction; (iii) intention to return to the Antarctic; (iv) intention to recommend the Antarctic to others as a good place to work; and (v) actual return. Differences between the fit perceptions of expeditioners who participate in summer and winterer expeditions will also be examined²³. Past research has indicated that fit perceptions and values congruence between organizations and employees share a strong relationship with such work attitudes (Judge and Bretz, 1992; Bretz and Judge, 1993; O'Reilly et al., 1991; Cable and Judge, 1996) and outcomes of this kind justify investment in selection procedures. In addition, this study will examine the relationship between values congruence and perceived group cohesion. Whilst past research has identified a positive association between group cohesion and outcomes variables, including job satisfaction, social status, group success and productivity (Dailey 1978; Lott and Lott, 1965; Summers, Coffelt, Horton, 1988; Podsakoff, MacKenzie and Ahearne, 1997), the relationship between values congruence and perceived group cohesion requires further investigation.

On the basis of past research on person-culture fit it is hypothesised that:

Hypothesis 1: Congruence between expeditioners' perceptions of Antarctic station values and their ideal organizational values will positively affect their subjective fit perceptions with Antarctic station life and culture.

Hypothesis 2: Expeditioners with greater fit will report greater job satisfaction.

Hypothesis 3: Expeditioners with greater fit will be more likely to: (i) return to the Antarctic in the future; and (ii) recommend the Antarctic as a good place to work.

²³ A summer expedition is up to 3 months duration over the Antarctic summer. A winter expedition is between 12 and 15 continuous months and includes an Antarctic winter.

Hypothesis 4: Expeditioners with better fit will report better group cohesion.

The first three hypotheses were derived from previous quantitative research on person-culture fit, and centred around three questions: (i) To what extent do expeditioners' perceptions of Antarctic station values fit their perceptions of ideal organizational values?; (ii) What are the determinants of good person-culture fit?; (iii) How important is person-culture fit in terms of job satisfaction, expeditioners' intention to return to Antarctica in the future, their intention to recommend the Antarctic to others, and their actual return. Hypothesis four was derived from past research on group cohesion and centred around the question: Does person-culture fit positively affect perceptions of group cohesion? In view of the results of the qualitative studies presented in Chapters 2 and 3, it is also hypothesised that:

Hypothesis 5: Men will report better fit with Antarctic station culture than women.

4.2 Method

4.2.1 Participants

The participants were 117 returned Australian National Antarctic Research Expeditioners who lived and worked on an Australian Antarctic or sub-Antarctic station between 1950 and 1999²⁴. Participants volunteered to take part in a study on "Australian Antarctic station life" by responding to an advertisement on the study calling for volunteers. The advertisement was published in "Aurora", the journal of the Australian National Antarctic Research Expeditioners (ANARE) Club of Australia. The group comprised 14 women and 103 men and included 105 "winterers" and 12 "summerers". The group included station leaders, medical practitioners, chefs, scientists, researchers, meteorological technicians and trades and communications personnel. Table 4.1 contains demographic information on the group, including age, station position, year of their last expedition and total number of expeditions per person.

²⁴In this study the sub-Antarctic comprised Macquarie Island only. References to "the Antarctic", "Antarctic stations" and "Antarctica" will hereinafter also include Macquarie Island station.

Table 4.1: Demographic information for Study III

	Females n = 14	Males n = 103	Total N = 117	%
Age (mean in years at time of interview and standard deviation)	39.7 (s.d.=6.33)	56.73 (s.d.=12.23)	54.71 (s.d.=12.91)	
Type of Expedition				
Winter and summer	9	96	105	89.7
Summer only	5	7	12	10.3
Station Position				
Station leader	2	6	8	6.8
Medical Doctor	2	10	12	10.3
Chef	2	3	5	4.3
Scientist/Researcher/Field assistant	5	25	30	23.1
Trades	-	25	25	21.4
Meteorological technician/weather observer	1	20	21	17.9
Communications technician	1	15	16	13.7
Expedition Year * (last)				
1950-59	-	12	12	10.3
1960-69	-	22	22	18.8
1970-79	-	24	24	20.5
1980-89	4	14	18	15.4
1990-99	10	31	41	35.0
No. of Expeditions (per person)				
1	8	42	50	42.7
2	4	34	38	32.5
3 or more	2	27	29	24.7

* Expeditions between 1950 and 1979 comprised men only.

Age

Ages ranged widely from 27 to 79 years. Given that this sample represents returned expeditioners who participated in Australian National Antarctic Research expeditions (ANARE) over the last 50 years, the mean age of this group is greater than the mean age of new ANARE recruits to Australian Antarctic stations annually, which is reported to be between 29 and 32 years, though ages may range from 18 to over 64 years in any expedition (Haywood, 1997).

The average age of male participants at the time of interview (56.7 years) was higher than the average age of female participants (39.7 years). This difference was largely due to the lack of women in ANARE expeditions prior to 1980. For additional information on the gender distribution of expeditions, refer to Table 4.1.

Gender

A total of 14 (12%) of the subjects in this study were women. Given that the proportion of women to men in ANARE wintering expeditions is reported to be approximately 1:8 (Haywood, 1997), the present sample is fairly representative of the gender distribution in ANARE expeditions annually.

Since the official introduction of women to ANARE in the late 1970s and early 1980s, women have typically been recruited as scientists, medical practitioners and chefs. Very few women have ever been recruited to expeditions as trade workers. Overall, this sample is therefore fairly representative of the gender distribution across positions since the first mixed ANARE expeditions. Refer to Table 4.1 for the proportion of men and women recruited as station leaders, medical practitioners, chefs, scientists, trade workers and technical staff in this sample.

Winterers & Summerers

As indicated in Table 4.1, the majority of participants (89.7%) had lived and worked on an Antarctic station between 12 and 15 continuous months, including an Antarctic winter (referred to as “winterers”), whilst 10.3% of the sample had lived and worked on a station

for up to 3 months over summer (“summerers”).²⁵

The results indicate a significant relationship between gender and wintering with the majority of winterers being men ($\chi^2 = 7.97$, $df = 1$, $p < .01$). This trend is consistent with the gender distribution of ANARE expeditions since the formal recruitment of mixed groups from the late 1970s. Figure 4.1 illustrates the proportion of men and women who participated in Antarctic winter and summer expeditions. The extent to which Antarctic station culture differs across summer and winter expeditions requires investigation and will be explored in this study.

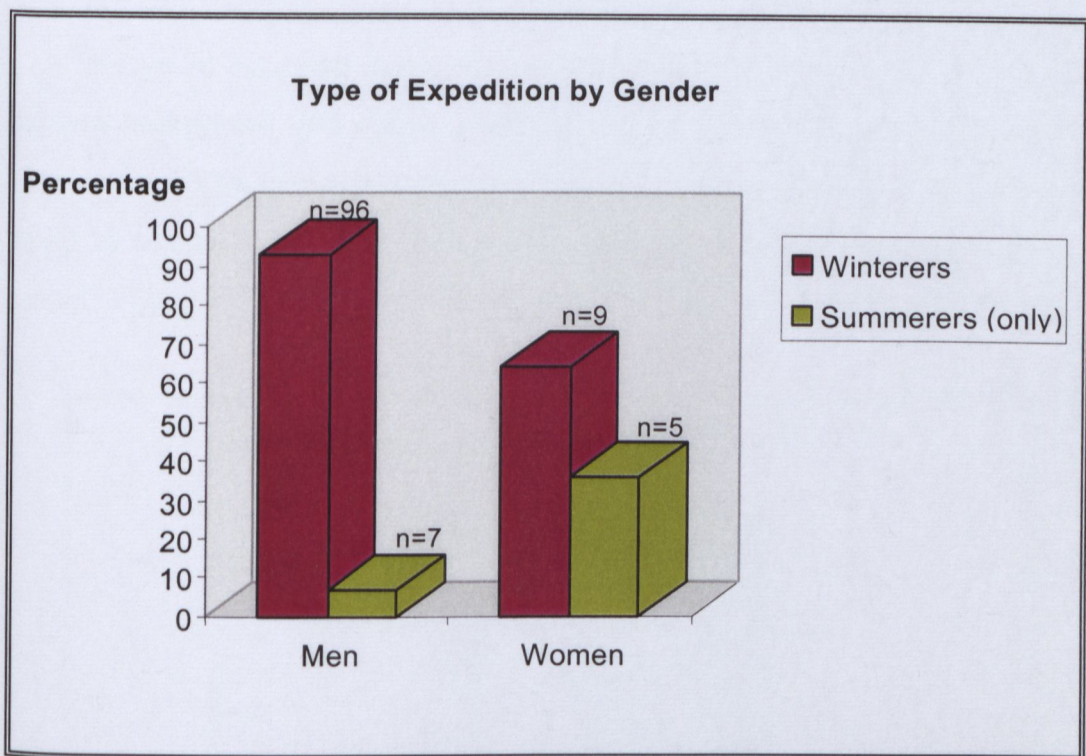


Figure 4.1: Percentage of men and women in winter and summer expeditions.

Educational Background

Educational background ranged from 1 (High school only) to 7 (Doctoral degree). The largest percentage of participants had university degrees (46.2%). A total of 40.2% had completed associate/technical degrees or diplomas, whilst 13.7% had no post secondary qualifications. A detailed list of participants' educational qualifications is shown in Table 4.2.

²⁵By virtue of their extended stay in Antarctica, winterers generally enjoy greater hierarchical status than summerers.

Table 4.2 Educational Qualifications

Type	N	%
Secondary school only	16	13.7
Associate/technical degree or diploma	47	40.2
Bachelors degree	31	26.5
Post graduate (Masters or PhD)	23	19.7
Total	117	100

It is of interest to note that there was a significant relationship between gender and educational background with women generally possessing more educational qualifications than men ($\chi^2 = 10.24, df = 3, p < .01$). The results are consistent with most women being recruited as scientists and the majority of men being recruited as technical and trades personnel. Figure 4.2 illustrates the distribution of educational qualifications by gender.

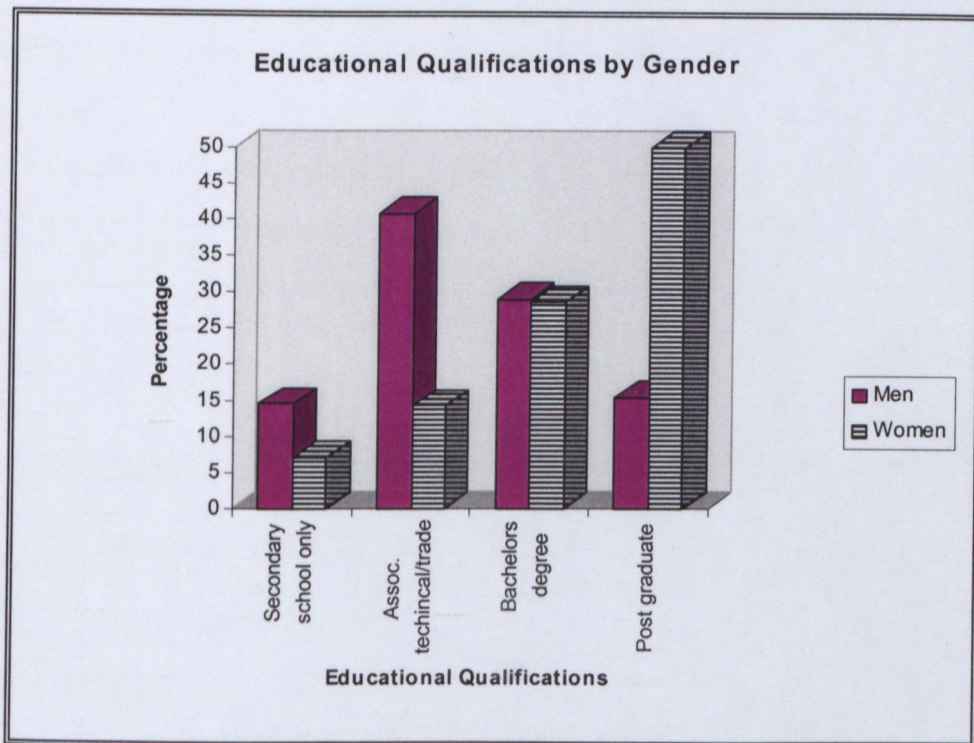


Figure 4.2 Percentage of men and women with qualifications at each level.

Expeditions

The number of expeditions to Antarctica ranged from 1 to 7 per person (Mean = 2.18, SD = 1.50). As Table 4.1 indicates, 42.7% of expeditioners participated in one expedition to the Antarctic whilst 57.3 % had participated in two or more expeditions. Appendix D1 contains a breakdown of the number of expeditions per participant.

Expedition Year

Expedition year, refers to the year of participants' last expedition to the Antarctic and ranged from 1950 to 1999 (mean=1979.5). Table 4.1 lists expedition year according to decade and Appendix D2 contains a breakdown by year.

Antarctic Station

Participants in this sample represented expeditions to all Australian Antarctic stations, including the three Australian Antarctic mainland stations (Mawson, Davis and Casey) and the Australian sub-Antarctic station of Macquarie Island. Table 4.3 indicates the location of participants' last Australian Antarctic expedition by station. As indicated, the distribution of participants across the four stations was almost equal. Refer to Chapter 1 for an outline of the location and history of each Australian Antarctic station.

Table 4.3 Location of last expedition

Station	N
Mawson	30
Davis	28
Casey* (incl. Wilkes)	28
Macquarie Island	28
More than one station	3
Total	117

*Wilkes station was replaced by Casey in 1968. Of the 28 participants who were stationed at Casey, 7 were stationed at Wilkes.

4.2.2 Measures

Antarctic station values

The Organizational Culture Profile (OCP; O'Reilly et al., 1991) was used to measure person-culture fit. The OCP employs a Q-sort technique and contains 54 value statements derived from a review of research on organizational values and culture (Chatman, 1991). The OCP has been advocated as a quantitative method of assessing an employee's fit within the context of an organizations' culture (Chatman, 1989, 1991; O'Reilly et al., 1991; Cable & Judge 1996).

The full version of the 54 item OCP was used to assess Antarctic station culture. Each participant was asked to sort the 54 items presented on 54 separate cards into nine categories, placing fewer items in the extreme and more items in the middle categories. Consistent with past research the requested distribution of the 54 cards was 2-4-6-9-12-9-6-4-2 (Chatman, 1991; O'Reilly et al., 1991). Participants were asked "Please sort these values into nine ordered categories according to the extent to which in your view, the values are characteristic of the culture of Australian Antarctic stations" and were provided with a smaller pack of 9 cards which together represented a scale of 1 to 9. The category anchors were 1 "least characteristic of Antarctic station culture" and 9 "most characteristic of Antarctic station culture". Appendix D3 contains the instructions to the Organizational Culture Profile and Appendix D4 contains the 54 value statements.

The extent to which participants assessed the values of Antarctic station culture in a similar way was assessed using Cronbach's alpha (Cronbach, 1951). Like other internal consistency methods Cronbach's alpha uses measurement data collected on a single occasion. However, Cronbach's alpha can also be used with instruments that have items with scores that fall into more than two categories (eg., Likert scales). Consistent with past research, the results demonstrated good validity with an alpha coefficient of .92. In a study of eight accounting firms, O'Reilly et al., (1991) reported an average alpha of .88, representing a range of .84 to .90.

Preferred individual values

The 54 item OCP was also used to assess participants' preferred organizational values. Participants were asked "Please sort these values into 9 ordered categories to indicate

your personal preference for each value in your ideal organization”. The category anchors ranged from 1 “least desirable” to 9 “most desirable”. The results of the second card sort formed the individual preference profiles. To mitigate potential common-method variance concerns (i.e. that expeditioners would describe Antarctic station culture as similar to their preferred organizational culture) participants were administered the second OCP two months later, and the instructions to the second procedure were quite different from those of the first. The question participants were asked to keep in mind during the second card sort was “how desirable is each attribute in my ideal organization?” Appendix D5 contains the instructions for the second OCP.

Person-organization fit

A person-organization fit (P-O fit) score was obtained by calculating the difference between the two profiles assessed with the OCP. Specifically, the difference between an individual’s perception of Antarctic station culture (OCP-Time 1) and their organizational preferences (OCP-Time 2) across the set of 54 items, measured P-O fit. One P-O fit score was calculated for each participant based on the absolute difference between the sum of the 54 item scores at Time 1 and Time 2 divided by 54. P-O fit scores ranged from .66 to 2.70.

Subjective fit

Consistent with previous research, participants’ subjective fit perceptions were measured using a three-item scale adapted from that used by Cable and Judge (1996). The scale comprises three questions: (i) “To what degree do you feel your values ‘matched’ or fitted the culture of Antarctic/sub-Antarctic stations?”; (ii) “To what degree do you feel your values ‘matched’ or fitted those of other expeditioners?”; and (iii) “Do you think the values and ‘personality’ of Antarctic/sub-Antarctic stations reflect your values and personality?”. Participants responded to each question using a 5-point Likert scale ranging from 1 “completely” to 5 “not at all”. The internal consistency of this three-item measure was .80.

Job satisfaction

Job satisfaction was measured using the 18 item O’Brien scale (O’Brien, Dowling and Kabanoff, 1978; O’Brien & Dowling 1980). Participants were asked to indicate how satisfied or dissatisfied they were with their work in Antarctica by responding to the 18 items of the O’Brien scale using a 5-point Likert scale ranging from 1 “very dissatisfied”

to 5 “very satisfied”. Individual responses to the 18 items were then summed to give a total satisfaction score ranging from 18 to 90. The O’Brien scale was selected because it was developed by researchers in an Australian context and has been applied to a wide range of organizations. Another advantage of the O’Brien scale is that it provides a measure of job satisfaction covering a range of facets, including supervision, coworkers, pay, skill level, opportunities for learning, influence, work pressure, feedback, promotion, physical conditions, challenge and opportunities for growth. The resulting internal consistency of this 12-item scale was .86. The mean satisfaction score for the group was 74.88 which is higher than the average of 67.2 reported by O’Brien and colleagues (1978) in business organisations. Appendix D6 lists the O’Brien scale items.

Intention to return

Participants’ intention to return to the Antarctic was measured with the question, “Would you be prepared to return again?” (1 = No, 2 = Yes) and “actual return” was determined by the extent to which participants had participated in more than one ANARE expedition. Previous research on person-organization fit has focused on employees’ intention to leave an organization as an outcome of fit because employees are cognisant of their values congruence within an organization and are more likely to leave it if they perceive a mismatch (Wanous, 1980; Schneider, 1987; O’Reilly et al., 1991; Cable and Judge, 1996). This question was included to determine the extent to which participants’ intentions to return to the Antarctic and actual return were a function of their perceived fit with Antarctic station culture.

Willingness to recommend Antarctica

An employee’s willingness to recommend an organization as a good place to work is also an important variable to consider in terms of person-organization fit. Consistent with previous research (Cable and Judge, 1996) this study assessed expeditioners’ willingness to recommend the Antarctic to others as a good place to work with the question, “Would you recommend the Antarctic to your friends as a good place to work?” (1 = No, 2 = Yes).

Group Cohesion

Group cohesion was measured using the 6-item Cohesion scale reported by Podsakoff, Mackenzie and colleagues (Podsakoff and MacKenzie, 1994; Podsakoff, MacKenzie and

Fetter, 1993). The scale consists of six items which are rated by respondents on a seven-point Likert scale ranging from “strongly agree” to “strongly disagree” and the referent for the items is the work group rather than the individual. The item responses are summed to give a single measure ranging from 6 to 42. Prior research conducted with the scale indicates that it possesses good psychometric properties, with reliabilities ranging from .91 to .93 (Podsakoff and MacKenzie, 1994; Podsakoff, Niehoff, MacKenzie and Williams, 1993). Consistent with past research, the internal consistency of this six-item measure was .93. The mean cohesion score for the group was 32.28 which is close to that reported by Podsakoff and MacKenzie (1994) for business organizations. Appendix D7 lists the six items of the Cohesion scale.

Control variables

Age, gender, educational qualifications, station position, type of expedition (whether an expeditioner was a winterer or summerer), and the year of their last expedition were used as control variables.

4.2.3 Procedure

Data were collected in two stages as described below.

Time 1. Each participant was forwarded the OCP comprising: (i) an instruction sheet; (ii) a pack of 54 value cards; and (iii) a smaller pack of nine cards representing a scale ranging from 1 “least characteristic of Antarctic culture” to nine “most characteristic of Antarctic culture”. Participants were asked to sort the values into nine ordered categories according to the extent to which, in their view, the values were characteristic of the culture of Australian Antarctic stations, in order to arrive at a description of perceived Antarctic station values. Participants were also asked to complete and return the 18 item O’Brien scale (job satisfaction), the Cohesion scale and a demographic questionnaire that included questions on age, gender, educational background, number of expeditions to the Antarctic, the year of their last expedition to the Antarctic, the station at which they were last located, their position, their intention to return to the Antarctic, and their willingness to recommend the Antarctic to others as a good place to work. Appendix D3 contains the instructions for the first OCP and Appendix D4 contains the 54 value statements.

Time 2. Two months after completing and returning the information provided at Time 1, participants were asked to complete the OCP again. On this occasion, however, participants were asked to sort the 54 values into nine ordered categories representing a scale ranging from 1 “least desirable” to 9 “most desirable” to arrive at a description of their “ideal organization”. Appendix D5 contains the instructions for the second OCP.

4.3 Results

4.3.1 Person-Organization fit

The means, standard deviations and correlations between person-organization fit (P-O fit), subjective fit and control and outcome variables appear in Table 4.4.

The difference between an individual’s perception of Antarctic station culture (OCP-Time 1) and their organizational preferences (OCP-Time 2) across the set of 54 items, measures P-O fit. As discussed in section 4.2.2, one P-O fit score was calculated for each participant based on the absolute difference between the sum of the 54 OCP item scores at time 1 and time 2. Hence, the smaller the difference between an individual’s perception of Antarctic station culture and their ideal organizational preferences, the lower the score and the better the ‘fit’. The correlation between P-O fit and subjective fit perceptions ($r=.52, p<.01$) suggests that two fit variables are related but distinct constructs, consistent with previous research (Rynes and Gerhart, 1990; Chatman, 1991; and Cable and Judge, 1996).

Small and medium correlations were identified between P-O fit and the control variables, particularly gender ($r=.41, p<.01$), age ($r=-.30, p<.01$), education ($r=.25, p<.01$), wintering ($r=.18, p<.05$) and expedition year ($r=.23, p<.01$). The results suggest that the older male participants with few qualifications who wintered in early expeditions achieved better P-O fit scores. Similarly, the small and medium correlations between subjective fit perceptions and age ($r=-.34, p<.01$), gender ($r=.46, p<.01$) and expedition year ($r=.23, p<.05$), indicate that older men who participated in early expeditions also reported better subjective fit with Antarctic station culture. The results are of interest because past research in business and education organizations has identified no significant correlations between P-O fit or subjective fit and age or gender (Chatman, 1991; O’Reilly et al., 1991; Cable and Judge, 1996). The findings may indicate that perceptions of Antarctic station

culture improve over time. Alternatively, the results may be indicative of changes to station culture over time, with the participants of early expeditions reporting better fit. In order to determine the extent to which perceptions of Antarctic station culture improved over time, the mean P-O fit scores and subjective fit scores for men were compared across the five decades from 1950 to 1999. Results indicated no significant differences between the mean P-O fit or subjective fit scores across the five decades that would suggest that perceptions of Antarctic station culture improve with time. A comparison between the mean scores of men who participated in expeditions before and after 1980 were also compared and similarly, revealed no significant differences in mean scores across the two eras. The above results may therefore be indicative of changes to Antarctic station culture over time, with the participants of early expeditions reporting better fit with a different station culture.

TABLE 4.4

Means, Standard deviations, and Correlations among Variables for Study III.

Variables	M	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Control Variables																
1. Age	54.71	12.91	-													
2. Gender (M=1, F=2)	1.12	.32	-.42**	-												
3. Education	3.73	1.73	-.13	.25**	-											
4. Position	4.63	1.80	-.00	-.17	-.29**	-										
5. Expeditions	2.18	1.50	.05	-.15	-.05	.02	-									
6. Winterer (W=1, S=2)	1.10	.30	-.22*	.30**	.31**	-.01	-.08	-								
7. Expedition year (last)	1979.51	14.13	-.73**	.36**	.03	-.12	.29**	.27**	-							
Person-Organization fit																
8. Subjective fit	10.89	1.82	-.34**	.46**	.09	-.15	-.17	.01	.23*	-						
9. P-O fit (OCP)	1.52	.43	-.30**	.41**	.25**	-.11	-.17	.18*	.23*	.52**	-					
10. Job satisfaction	74.88	7.91	.15	-.25**	-.08	-.00	.11	-.02	-.05	-.48**	-.33**	-				
11. Intent to return (N=1, Y=2)	1.18	.38	-.24**	.10	-.11	-.01	.11	.16	.37**	.03	-.07	.13	-			
12. Intent to recommend (N=1, Y=2)	1.03	.18	.08	.07	.11	.04	-.01	.06	-.13	.22*	-.10	.07	-.03	-		
13. Returned (N=1, Y=2)	1.57	.49	.00	-.10	.07	-.01	.68**	.00	.24**	-.09	-.09	.10	.13	-.07	-	
14. Group cohesion	32.28	7.79	.23*	-.32**	-.08	-.14	-.01	.07	-.20*	-.47**	-.39**	.36**	.09	.01	.02	-

* $p < .05$, ** $p < .01$ (two tailed)Max $N=117$, Min $N=112$

The correlation results show that P-O fit and subjective fit perceptions significantly affected job satisfaction ($r=-.33$, $p<.01$ and $r=-.48$, $p<.01$, respectively), indicating that better fit was associated with higher job satisfaction, consistent with the findings of previous research (Chatman, 1991; O'Reilly et al., 1991). The results also indicate that P-O fit and subjective fit perceptions significantly affected perceived group cohesion ($r=-.39$, $p<.01$ and $r=-.47$, $p<.01$, respectively), highlighting that perceived fit positively affected perceptions of group cohesion. Interestingly, P-O fit was not significantly related to participants' intent to return or actual return to Antarctica, suggesting that expeditioners who choose to return to Antarctica are not motivated by their perceived fit with station culture but return for other reasons, such as interest in the work itself, the financial rewards associated with some station positions, long term career aspirations (eg in research), or the desire for a short term lifestyle or career change. Similarly, there was no correlation between P-O fit and participants' willingness to recommend Antarctica to others, suggesting that expeditioners who perceived themselves as fitting in to Antarctic culture would not necessarily recommend it to others as a good place to work. This finding is inconsistent with previous research in business settings (eg., Cable and Judge, 1996) which showed that employees who perceived themselves as fitting in were more likely to recommend an organization to others. However, these results are consistent with the findings of the first qualitative study in this thesis (refer to Chapter 1; "Fitting in to Antarctic station culture") which indicated that many expeditioners reported that they would only recommend Antarctica to people who possessed certain individual attributes and social skills.

A number of correlations were found between control variables. Specifically, the correlations between gender and age ($r=-.42$, $p<.01$), and gender and education ($r=.25$, $p<.01$), indicate that the women in this study were generally younger and more educated than the men. The correlations between gender and expedition year ($r=.36$, $p<.01$), and gender and wintering ($r=.30$, $p<.01$), highlight the lack of women in early ANARE expeditions, and the tendency for women to participate in summer rather than winter expeditions. The correlations between wintering and age and wintering and education ($r=-.22$, $p<.05$ and $r=.31$, $p<.01$ respectively) suggest that the majority of winterers were older men who had participated in earlier expeditions and usually had few formal qualifications, whilst the majority of summerers were younger women, with more

educational qualifications who were recruited from the 1980s onwards. Given that mixed expeditions were introduced from the 1980s onwards and the proportion of women to men on stations is about 1:8, the above results are fairly representative of returned Australian Antarctic expeditioners living in Australia at the time of this research (1998-2000).

A number of correlations were found between control and outcome variables. In particular, the negative correlation between age and intention to return ($r=-.24$, $p<.01$) and the significant positive correlation between expedition year and intention to return ($r=.37$, $p<.01$) indicate that older participants and those who took part in early expeditions were less likely to indicate that they intended to return to Antarctica. The negative correlation between age and expedition year ($r=-.73$, $p<.01$), confirms that older expeditioners participated in earlier ANARE expeditions, as expected. As Table 4.4 shows, job satisfaction was negatively correlated with gender ($r=-.25$, $p>.01$), suggesting that men reported better job satisfaction than women. The results also indicate a significant positive correlation between actual return and expedition year ($r=.24$, $p<.01$), indicating that the participants of more recent ANARE expeditions were more likely to actually return to the Antarctic. The correlations between group cohesion and expedition year ($r=-.20$, $p<.05$) and group cohesion and job satisfaction ($r=.36$, $p<.01$), suggest that the participants of early ANARE expeditions reported better group cohesion and those who reported better group cohesion also reported higher job satisfaction. In addition, the small positive correlation between age and group cohesion ($r=.23$, $p<.05$), and the negative correlation between gender and group cohesion ($r=-.32$, $p<.01$), highlight that older male expeditioners perceived their stations as functioning more cohesively than did younger men or women in this study.

4.3.2 The Antecedents of fit

In order to assess the possibility of more complex relationships between the control and outcome variables and person-organization fit, further analyses were undertaken. Although correlations suggest a number of important predictor variables, their relative importance is not clear. The predictor variables are correlated with each other and overlap to some degree. The procedure that makes it possible to predict a person's score on one variable from knowledge of their scores on at least two other variables is multiple

regression. A procedure referred to as the “least square method” is used to find the linear combination of variables that does the best job of predicting a person’s score on a given variable (Jaeger, 1990).

Ordinary-least-squares multiple regression analyses were used to examine the predictors of subjective fit perceptions and the results appear in Table 4.5. Overall, this set of variables accounted for 42% of the variance in fit perceptions. Hypothesis 1, that congruence between an expeditioners’ perception of Antarctic station values and their own values is predictive of their perceived fit with Antarctic station culture, was supported. The results also support hypothesis 5, that men reported better subjective fit with Antarctic station culture than women, indicating that gender was a significant predictor of perceived fit. In addition, as shown in Table 4.5, age had a significant effect on subjective fit perceptions and a moderately significant effect between wintering and subjective fit was also identified.

TABLE 4.5
Regression Estimates Predicting Subjective Fit Perceptions.

Variable	B	β	<i>t</i>	<i>p</i>
Age	-.02	-.19	-2.23	.02*
Education	-.09	-.08	-1.00	.31
Gender (M=1, F=2)	1.43	.26	2.78	.00**
Expeditions	-.12	-.10	-1.28	.20
Winterer (W=1, S=2)	-.97	-.16	-1.99	.05
Position	-.10	-.10	-1.26	.20
P-O fit (OCP)	1.69	.40	4.61	.00**

$R = .65$, $R^2 = .42$, Adjusted $R^2 = .38$,

$F(7,101) = 10.50$, $p < .0001$

* $p < .05$, ** $p < .01$ (two tailed)

$N=109$

In order to gauge the separate influence of age, gender and wintering on subjective fit perceptions, a hierarchical regression was undertaken entering age, gender and wintering in the first step, and person-organization fit (P-O fit) in the second step, when predicting subjective fit. This analysis was necessary to determine the extent to which P-O fit accounted for independent variance in subjective fit perceptions. The results indicate that the change in R^2 resulting from the exclusion of the three control variables was highly significant (F ch. = 22.2, R^2 ch. = .128, $df = 1,104$, $p < .001$), indicating that despite the overall significant effect of the control variables, P-O fit accounted for significant independent variance. The results of the hierarchical regression are presented in Table 4.6.

TABLE 4.6
Hierarchical Regression Estimates Predicting Subjective Fit Perceptions.

Model	Variable	Final B	Final β
1.	Age	-.03	-.21
	Gender (M=1, F=2)	2.32	.42
	Winterer (W=1, S=2)	-.98	-.16
	$R^2 = .27^{**}$, $F_{ch.} = 13.05$, $df = 3, 105$		
2.	P-O fit (OCP)	1.71	.40
	$R^2 = .40^{**}$, $F_{ch.} = 22.27$, $df = 1, 104$		
	R^2 ch. = .12		

* $p < .01$ ** $p < .001$ (two tailed)

4.3.3 The Outcomes of fit

The predictors of job satisfaction, intention to return to Antarctica, intention to recommend Antarctica, actual return and group cohesion were tested using multiple regression analyses and the results are presented in Tables 4.7, 4.8 and 4.9. Hypothesis 2, that participants with better perceived fit will report greater job satisfaction was supported, with the other variables controlled. In addition, hypothesis 4, that participants

with better fit will report better group cohesion was also supported, with the other variables controlled. Interestingly, hypothesis 3, that expeditioners with better perceived fit will be more likely to: (i) return to the Antarctic in the future; and (ii) recommend the Antarctic as a good place to work, was not supported.

As Tables 4.7 indicates, subjective fit perceptions positively and significantly predicted participants' job satisfaction, but had no significant effect on their intention to return or actual return to Antarctica. Interestingly, the results show that expedition year was the only variable that had a significant unique effect on expeditioners' intention to return. As Table 4.8 indicates, although position and gender had unique effects on participants' willingness to recommend Antarctica to others, the overall effect of the regression model was not statistically significant. It is also of interest to note that age, expedition year and wintering experience, rather than perceived fit, predicted the extent to which expeditioners returned to the Antarctic, with older winterers who had recently participated in an expedition more likely to return.

As shown in Table 4.9, participants' subjective fit perceptions, education, station position, expedition year and wintering status had significant unique effects on their perceptions of group cohesion. In order to gauge the separate influence of subjective fit perceptions, a hierarchical regression was undertaken entering the control variables in the first step, and subjective fit in the second step when predicting group cohesion. This analysis was necessary to determine the extent to which subjective fit accounted for independent variance. The results show that the change in R^2 resulting from the exclusion of the four control variables was highly significant (F ch. = 27.64, R^2 ch. = .17, df = 1,105, $p < .001$), indicating that despite the overall significant effect of the control variables, subjective fit perceptions accounted for significant independent variance. The results of the hierarchical regression are presented in Table 4.10.

TABLE 4.7

Regression Estimates Predicting Job satisfaction and Intention to return.

Variable	Job Satisfaction				Intention to return			
	B	β	<i>t</i>	<i>p</i>	B	β	<i>t</i>	<i>p</i>
Age	.03	.05	.38	.70	.00	.01	.08	.93
Education	-.24	-.05	-.57	.56	.03	-.16	-1.65	.10
Gender (M=1, F=2)	-1.46	-.06	-.58	.56	.05	.04	.39	.69
Winterer (W=1, S=2)	.32	.01	.13	.89	.13	.10	1.07	.28
Position	-.39	-.09	-.99	.32	.00	-.03	-.30	.76
Perceived fit	-1.95	-.45	-4.64	.00**	.02	-.12	-1.17	.24
Expedition year (last)	.02	.04	.37	.70	.01	.34	2.49	.01*
<i>R</i>	.50				.40			
<i>R</i> ²	.25**				.16**			
Adjusted <i>R</i> ²	.20				.10			

p* < .05, *p* < .01 (two tailed)*N*=114

TABLE 4.8
Regression Estimates Predicting Willingness to Recommend and Return.

Variable	Willingness to Recommend				Actual Return			
	B	β	<i>t</i>	<i>p</i>	B	β	<i>t</i>	<i>p</i>
Age	-.00	-.01	-.12	.90	.05	.46	3.68	.00**
Education	.01	.09	.86	.39	.10	.12	1.32	.20
Gender (M=1, F=2)	.14	.25	2.14	.03*	-.61	-.14	-1.37	.17
Winterer (W=1, S=2)	.00	.04	.41	.68	-.87	-.18	-2.03	.04*
Position	.03	.31	2.88	.00**	.07	.10	1.12	.26
Perceived fit	.00	.15	1.11	.27	-.10	-.12	-1.34	.18
Expedition year (last)	.00	.00	.03	.97	.08	.80	6.50	.00**
<i>R</i>	.34				.56			
<i>R</i> ²	.11				.31**			
Adjusted <i>R</i> ²	.06				.27			

p* < .05, *p* < .01 (two tailed)

N=114

TABLE 4.9
Regression Estimates Predicting Perceived Group Cohesion.

Variable	B	Perceived Group Cohesion		
		β	<i>t</i>	<i>p</i>
Age	-.05	-.09	-.76	.44
Education	-.81	-.18	-2.03	.04*
Gender (M=1, F=2)	-4.00	-.16	-1.60	.11
Winterer (W=1, S=2)	6.13	.24	2.70	.00**
Position	-1.31	-.31	-3.60	.00**
Perceived fit	-1.67	-.38	-3.92	.00**
Expedition year (last)	-.14	-.26	-2.17	.03*
<i>R</i>	.59			
<i>R</i> ²	.35			
Adjusted <i>R</i> ²	.31			

p* < .05, *p* < .01 (two tailed)
N=111

TABLE 4.10
Hierarchical Regression Estimates Predicting Group Cohesion Perceptions.

Model	Variable	Final B	Final β
1.	Education	-.71	-.18
	Winterer (W=1, S=2)	5.44	.22
	Position	-1.00	-.23
	Expedition Year	-.18	-.33
	<i>R</i> ² = .14*, <i>F</i> ch. = 4.49, <i>df</i> = 4, 106		
2.	Perceived Fit	-1.94	-.44
	<i>R</i> ² = .32**, <i>F</i> ch. = 27.64, <i>df</i> = 1, 105		
	<i>R</i> ² ch. = .17		

p* < .01 *p* < .001 (two tailed)

Although not explicit in hypotheses 3 and 4, the model articulated suggests that subjective fit affects job satisfaction and group cohesion, but only as it is interpreted as values congruence (P-O fit; OCP). Consistent with the past research (e.g., Cable and Judge, 1996), the extent to which subjective fit perceptions mediate the effect of person organization fit on outcome variables was explored. As recommended by Baron and Kenny (1986) a mediation analysis was undertaken to calculate the direct, indirect, and total effects of P-O fit (OCP) on job satisfaction and perceived group cohesion. The proportion of the influence that was mediated was calculated by dividing the indirect effect by the total effect. As Table 4.11 indicates, 56 % of the effect of P-O fit on satisfaction was mediated through subjective fit judgements and 37% of the effect of P-O fit on group cohesion was mediated through subjective fit judgements.

TABLE 4.11
Regression Estimates Testing Mediation of Values Congruence on Job Satisfaction and Perceived Group Cohesion.

Variable	Job Satisfaction	Group Cohesion
Direct effects	.11**	.17**
Indirect effects	.14**	.10**
Total effects	.25**	.27**
% Mediation	56	37

* $p < .05$, ** $p < .01$ (two tailed)

4.3.4 Antarctic station values

Research on the conceptual framework of the OCP by O'Reilly and colleagues (1991) indicated that the OCP measures eight dimensions of organizational culture, comprising: Attention to detail; Orientation toward outcomes or results; Aggressiveness and competitiveness; Supportiveness; Emphasis on growth and rewards; Collaborative and team orientation; and Decisiveness. The dimensions are based on data collected from 826 accountants in seven different firms who completed the OCP to describe their organization's culture. Results of a principal components analysis and varimax rotation using the data revealed 26 items with loadings greater than .40. (O'Reilly et al., 1991). Appendix D8 contains the results of this analysis.

In this study, data collected on the OCP was factor analysed using a principal components analysis with varimax rotation to examine its underlying structure in terms of the values of Australian Antarctic station culture. The results of the factor analysis were inconsistent and the correlation matrix was not positive. Further work is therefore required to determine the extent to which the OCP reflects meaningful dimensions of culture in business as well as non-business organizations, and the extent to which it can be applied to isolated research organizations in extreme environments (eg., polar, undersea and space).

In terms of values, results of the OCP (Time 1) ranking revealed that the values most frequently rated 8 or 9 (most characteristic of Antarctic station culture) differed according to gender. Whilst men identified Adaptability, Flexibility and Tolerance as the three most characteristic values of Antarctic station culture (in order of frequency), women identified Informality, followed by Fitting in, and Developing friends at work. The values identified by men as least characteristic of Antarctic station culture (i.e. rated 1 or 2), comprised: Being aggressive, Being demanding, and Security of employment, whilst the values identified by women as least characteristic comprised: Security of employment, Being aggressive and Being distinctive (in order of frequency). The values most frequently ranked as “most characteristic” and “least characteristic” of station culture by men and women in this study are summarised in Figure 4.3.

Women’s reference to Being distinctive (as least characteristic) and Fitting in (as most characteristic) highlights the importance of member similarity in determining the extent to which individuals fitted into Antarctic station culture. The finding also shows that women regarded being distinctive as disadvantageous to fitting in to station culture - a result that may be indicative of their minority status in ANARE expeditions over the last two decades. This finding is consistent with past research on the psychological process of identity formation that has shown that in discriminating between in-groups and out-groups, people are attracted to those seen as similar to themselves (O’Reilly et al., 1991). The result is also consistent with the results of the previous qualitative study (refer to Chapter 3) that revealed that when asked what one required in order to “fit” into the culture of Antarctic stations, women’s responses were organized around the notion that in order to “fit in”, women needed to tolerate inappropriate behaviour from the majority of male workers, including sexist attitudes and excessive drinking.

To determine the extent to which two distinct eras of Antarctic station culture existed with distinct values, the values identified as most characteristic and least characteristic of Antarctic station culture by men who participated in all male expeditions before 1980 were compared with the values of men who participated in expeditions from 1980 onwards. The data did not reveal any significant trends or changes in perceived values across the two eras. The values identified as most characteristic of Antarctic station culture prior to 1980 (in order of frequency) comprised: Adaptability, Tolerance, and Flexibility. Similarly, the values identified as most characteristic of expeditions from 1980 onwards comprised: Flexibility followed by Adaptability, and Tolerance. The values ranked as least characteristic of Antarctic station culture were identical for both groups and comprised: Being Aggressive, Security of Employment and Being Demanding (in the same order of frequency).

To determine the extent to which tradesmen and scientists perceived Antarctic station culture differently, the values identified as most characteristic and least characteristic of Antarctic station culture by men in the two occupational groups were compared. The data revealed some differences between the groups that may account for the perceived conflict between them identified in the first qualitative study of this thesis. In particular, the values identified as most characteristic of Antarctic station culture by tradesmen (in order of frequency) comprised: Adaptability, Tolerance, and Team-oriented, whilst the values identified as most characteristic of the culture by male scientists comprised: Flexibility followed by Adaptability, and Enthusiasm for the job. The values ranked as least characteristic of Antarctic station culture were similar for the two groups; the values identified as least characteristic by tradesmen (in order of frequency) comprised: Being Aggressive, Being Demanding and Rule-oriented, and the values identified as least characteristic by scientists (in order of frequency) comprised: Being Aggressive, Security of Employment and Being Demanding.

The results of the second OCP ranking (Time 2) revealed that organisational preferences also differed according to gender. For instance, the values most frequently rated 8 or 9 (most desirable values in their ideal organization) by men comprised: Adaptability, Enthusiasm for the job, and Flexibility (in order to frequency), while for women the most desirable values comprised: Fairness, Enthusiasm for the job, and Tolerance (in order of frequency). Interestingly, the values ranked as least desirable (i.e. most frequently rated 1 or 2) were the

same for both men and women and comprised: Being Aggressive, Being demanding and Being Rule-oriented (in the same order of frequency).

A comparison of the values identified as most desirable and least desirable in the “ideal organization” by men who participated in all male expeditions prior to 1980 were compared with the values of men who participated in expeditions from 1980 onwards. The data revealed some differences in organisational preferences across the two eras. In particular, the values identified as most desirable prior to 1980 (in order of frequency) comprised: Enthusiasm for the job, Adaptability and Innovative, whilst the values identified as most desirable from 1980 onwards comprised: Adaptability, Flexibility, Tolerance, suggesting some changes in organizational preferences over time. Interestingly, the values ranked least desirable were similar for both groups and comprised: Being Aggressive, Being Demanding, and Being Rule-oriented (in order of frequency). The values most frequently ranked “most desirable” and “least desirable” in the ideal organization by men and women in this study are summarised in Figure 4.4.

The results of the second OCP ranking (Time 2) also revealed some differences between the organisational preferences of tradesmen and male scientists. For instance, the values most frequently rated 8 or 9 (most desirable values in their ideal organization) by tradesmen comprised: Enthusiasm for the job, Team-oriented and Adaptability (in order to frequency), while for scientists the most desirable values comprised: Tolerance, Being innovative and Enthusiasm for the job (in order of frequency). Interestingly, the values ranked as least desirable (i.e. most frequently rated 1 or 2) were similar for both groups but with a minor variation. The values identified as least desirable by tradesmen comprised: Being Aggressive, Being demanding and Being Rule-oriented (in the order of frequency), while the values identified as least desirable by scientists comprised: Being Aggressive, Being demanding, and Emphasizing a single culture throughout the organization (in the order of frequency).

	Values least characteristic	Values most characteristic
WOMEN	Security of employment	Informality
	Being aggressive	Fitting in
	Being distinctive	Developing friends
MEN	Being aggressive	Adaptability
	Being demanding	Flexibility
	Security of employment	Tolerance
TOTAL GROUP	Being aggressive	Adaptability
	Security of employment	Flexibility
	Being demanding	Tolerance

Figure 4.3: Values identified as least characteristic and most characteristic of Antarctic station culture.

Least desirable values

Most desirable values

WOMEN

Being aggressive

Fairness

Being demanding

Enthusiasm for the job

Being rule-oriented

Tolerance

MEN

Being aggressive

Adaptability

Being demanding

Enthusiasm for the job

Being rule-oriented

Flexibility

TOTAL GROUP

Being aggressive

Adaptability

Being demanding

Enthusiasm for the job

Being rule-oriented

Flexibility

Figure 4.4: Values identified as least desirable and most desirable in the "ideal organization".

4.4 General Discussion

The results of this study support the proposition by Cable and Judge (1996) that subjective fit perceptions emanate from the congruence between perceived organizational values and preferred individual values. The results are also consistent with past empirical evidence suggesting that people select organizations in which their personal characteristics are aligned with organizational attributes (Chatman, 1989, 1991; O'Reilly, 1991; Judge and Bretz 1992; Cable and Judge, 1994).

Contrary to the findings of Cable and Judge (1996), however, the results of this study suggest that within the context of Antarctic station life, perceived fit is affected by demographic variables such as gender, with men reporting better fit with Antarctic station culture than women. Furthermore, the results indicate that age and wintering had an independent effect on perceived fit, suggesting that demographic similarity is an important component of person-organization fit, with individuals demographically similar to the dominant Antarctic station cohort reporting better fit into Antarctic station culture.

Within the context of Australian Antarctic station culture, the strong relationship between gender, age and perceived fit supports the findings of the previous two qualitative studies in this thesis that highlighted the existence of a male dominated culture on stations, and the prevalence of gender based problems, since the introduction of women in Antarctic wintering expeditions more than two decades ago. It was of interest to note that the results also revealed that women expeditioners possessed more educational qualifications and were typically recruited as scientists compared to the majority of men who reported technical and trade skills and dominated trades positions on stations. The results highlight the impact of gender in terms of interpersonal conflict on stations, particularly between scientists and trades workers. The results also highlight the extent to which gender differences in perceived fit and values congruence may reflect socio-economic differences between these groups. Overall, the findings are consistent with the proposition that two distinct eras of Antarctic station culture existed since the 1950s: the all-male era of ANARE when the culture of Antarctic stations was created and when demographic similarity between recruits was at its optimum, and the two decades of mixed ANARE expeditions since that time in which women have been under-represented in winter expeditions.

In terms of values, OCP results highlighted some differences in the values that men and women identified as most characteristic and least characteristic of Antarctic station culture. In particular, women referred to “Being distinctive” as least characteristic and “Fitting in” as most characteristic of Antarctic station culture, highlighting that most women perceived being distinctive or different to the group as disadvantageous to good fit. Results of the OCP also revealed that organisational preferences (values of participants’ ideal organization) differed according to gender. For instance, whilst men identified Adaptability, Enthusiasm for the job, and Flexibility as the three most desirable values in an organization, women identified Fairness, Enthusiasm for the job, and Tolerance. These results are consistent with the findings of the previous two qualitative studies in this thesis, and may highlight the minority status of women on stations since the introduction of mixed expeditions, and the extent to which women may comprise a *counterculture* to the dominant male culture on Australian Antarctic stations (Martin and Siehl, 1983)²⁶.

Results comparing the values identified as most characteristic and least characteristic of the culture by men who participated in expeditions before 1980 and those who participated in expeditions from 1980 onwards did not reveal any significant changes to suggest that expeditioners’ perceptions of Antarctic station culture changed over time. However, results comparing the values identified as most characteristic and least characteristic of the culture by tradesmen and scientists did reveal some differences between the two occupational groups. The comparisons were undertaken in order to explore possible sources of professional animosity between scientists and tradesmen identified in the first two qualitative studies of this thesis. The results indicated that the values identified as most characteristic of Antarctic station culture by tradesmen comprised: Adaptability, Tolerance, and Team-oriented, whilst the values identified as most characteristic of the culture by male scientists comprised: Flexibility followed by Adaptability, and Enthusiasm for the job. Results of the OCP also revealed differences between the organisational preferences (values of participants’ ideal organization) of the two groups. For instance, while tradesmen identified Enthusiasm for the job, Team-oriented, and Adaptability as the three most desirable values in an organization, scientists identified Tolerance, Being innovative, and Enthusiasm for the job as their ideal

²⁶ According to Martin and Siehl (1984), *countercultures* exist in organizational groups which possess core values that directly challenge those of the dominant culture. Refer to Organizational Subcultures (Chapter 1) for additional information.

organizational values. The differences highlight the extent to which tradesmen and scientists may comprise occupational subcultures on Australian Antarctic stations.

Consistent with past research, participants' perceived fit positively and significantly predicted their job satisfaction (Chatman, 1989, 1991; O'Reilly et al. 1991; Cable and Judge, 1996). The results also revealed a significant positive association between perceived group cohesion and job satisfaction, supporting the proposition of past research that individuals are unlikely to feel attracted to a group unless they experience some personal satisfaction from their membership of it (Dailey, 1978; Summers et al., 1988). In addition, the results show that participants' perceived fit into Antarctic station culture positively and significantly predicted their perceptions of group cohesion, extending existing Antarctic and P-O fit research. Furthermore, consistent with the findings of Cable and Judge (1996), this study also indicated that perceived values congruence affected job satisfaction and group cohesion, but only as perceived values congruence was interpreted as subjective fit.

There is no previous empirical research on Antarctic expeditioners' willingness to return to the Antarctic or their willingness to recommend the Antarctic to others. However, the results of this investigation revealed that contrary to past research in business settings (Chatman, 1989, 1991; O'Reilly et al. 1991; Cable and Judge, 1996), perceived fit did not predict participants' intention to return to the Antarctic in the future or their willingness to recommend the Antarctic to others. Rather, the results suggest that expeditioners who choose to return to the Antarctic may return for one or more other work related outcomes, including: (i) work demands, that may require expeditioners to participate in more than one expedition in order to complete their work; (ii) financial rewards, with most (non-research) winter positions offering generous allowances; (iii) career development, particularly in the case of scientists and researchers who receive little or no remuneration and are motivated by opportunities for research in Antarctica; and (iv) the desire for a lifestyle and career change. Results also suggest that expeditioners who recommend the Antarctic to others as a good place to work are not necessarily motivated by their own perceived fit with Antarctic station culture but may recommend it on the basis of other reasons, such as the extent to which they believe an individual is likely to fit in.

Results demonstrated that participants' intention to return was strongly affected by their expedition year, with the participants of recent expeditions indicating that they were more

likely to return. A possible explanation is that the participants of early ANARE expeditions (eg., expeditions in the 1950s, 1960s and 1970s) were aware that their age precluded them from future expeditions and were therefore less likely to indicate an intention to return in the future. Another possible explanation is that participation in an ANARE expedition is a unique and temporary ‘once-off’ life experience (up to 3 months for summerers and up to 15 months for winterers), and job outcomes such as intention to return and willingness to recommend are less relevant here than in more permanent business settings. For instance, for ANARE scientists, in particular, return to Antarctica is usually determined by their research requirements rather than their perceived fit with station culture.

This study has extended past person-organization fit research by exploring the relationship between person-organization fit and “actual” return as an outcome. The results showed that person-organization fit did not predict “actual” return, but that demographic variables, including age, wintering experience and expedition year, positively and significantly predicted expeditioners’ “actual return” to Antarctica, with older recent winterers being more likely to return. A possible explanation is that expeditioners who choose to return to the Antarctic are not necessarily attracted to Antarctic station life because of the extent to which Antarctic station values are aligned with their own values but may return for other reasons, such as those listed above. Another possible explanation is that the results are indicative of the priority of prior wintering experience over other individual attributes in the selection and recruitment of ANARE wintering personnel.

4.4.1 Implications

By exploring the role and outcomes of values congruence within the context of personnel in an isolated and confined setting, this research study has added generalizability to past research on person-organization fit (Cable and Judge 1996). In particular, this study showed that the OCP is a useful semantic tool that can be used to clarify the values and culture of Australian Antarctic stations, though more research is required to determine its applicability in non-business organizations. This study also generated a profile representing ANARE values over the last 50 years of ANARE that highlights significant changes to Antarctic station values from the 1980s onwards. Consistent with the notion that an optimal level of person-culture fit may be achieved (Chatman 1989), this information can help the Australian Antarctic Division (AAD) to (i) enhance the selection and socialization of Antarctic recruits, (ii) guide the evolution of Antarctic station culture by enhancing cultural elements considered critical to

ANARE goals and practices and “unlearning” of cultural elements that are viewed as dysfunctional, or (iii) instigate managed cultural change if elements of the culture are perceived to be dysfunctional for the organization’s survival and growth in a changing environment.

Consistent with past research (Schein, 1990), if the leaders of an organization perceive that they do not have the time to let evolution occur naturally or if they perceive that the natural evolution process is heading the organization in the wrong direction, desired cultural change may be instigated through managed intervention. Through a managed change process, cultural elements viewed as desirable may be enhanced and cultural elements considered detrimental may be ‘unlearned’ (Argyris and Schon, 1978; Argyris, Putnam and Smith, 1985; Walton, 1987; Hanna, 1988; Tushman and O’Reilly, 1997). Managing change involves moving an organization from its current state to its desired future state through a transition period. Researchers (eg., Schein, 1990; Tushman and O’Reilly, 1997) suggest that certain leadership behaviours are vital for achieving a process of managed change and ideally, the transition process should be instigated by an organization’s leaders using anyone or more of the following strategies (Schein, 1990): (i) leaders may instigate change by highlighting the threats to the organization, if no change occurs, and encouraging members to believe that change is both highly desirable and possible; (ii) leaders may articulate a new direction and a new set of assumptions, in order to gather support for change; (iii) key positions in the organization may be filled with new recruits who hold values consistent with the desired direction of cultural change; (iv) the adoption of the new direction may be rewarded and encouraged and adherence to the old direction may be discouraged; (v) organizational symbols, rituals and myths that preserve dysfunctional traditions may be discredited and artefacts, values, and norms linked to old assumptions may be destroyed; and (vi) new symbols, rituals, and heroes may be created.

Within the context of Antarctic station culture, managed change may assist the AAD to: (i) address recurring social problems on stations (eg., drunkenness and behaviour that may threaten the social functioning of stations as social systems, thereby reducing overall productivity) through better selection and recruitment practices; and (ii) ensure that Antarctic station culture is better aligned with current ANARE goals and practices by promoting different values and behavioural norms and articulating a new direction.

In summary, this study showed that congruence between perceived Antarctic station values and individual values, and demographic characteristics such as age and gender, predicted subjective fit with Antarctic station culture. In particular, the results indicated that men perceived themselves as fitting in to Antarctic station culture better than women. By implication, women also perceived men as fitting in better. The results also showed that person-organization fit predicted job satisfaction and group cohesion. Within the context of Antarctic station culture, however, one needs to consider the extent to which “good fit” with the current Antarctic station value system is desirable, given the under-representation of women on stations and the recurring social problems. Consistent with the findings of the previous two studies in this thesis, it may be argued that a better “mix” of expeditioners in terms of gender and age is preferable in order to change the current value system and to: (i) improve the degree of fit of women expeditioners to Antarctic station culture; and (ii) overcome behaviours considered to threaten the functioning of Antarctic stations as harmonious research communities.

4.4.2 Limitations & Future research

This study has several limitations that should be acknowledged. First, it may be argued that organizational culture was assessed here on the basis of individual’s perceptions of Antarctic station culture rather than “actual culture” (i.e. as determined by independent observers). Although the Australian Antarctic Division’s support for this research was sought to enable the collection of data through direct observation, the researcher was denied the opportunity to participate in an expedition, and consequently Antarctic station culture had to be solely assessed on the basis of expeditioners’ reports. A second potential limitation of this study relates to the use of a Q-sort procedure to assess the profile similarity of organizational and individual values. Although profile similarities have been recommended by past research, they have also been criticised because they focus on entire profiles instead of specific dimensions of fit and ipsative rather than normative measurement (Edwards, 1993; Cable and Judge, 1996). Furthermore, despite the fact that Q-sort measurement has been described as the most appropriate method of values assessment (Chatman, 1989; Meglino, Ravlin and Adkins, 1989) the “forced” distribution of responses may have constrained participants’ responses. Nevertheless, it is important to note that an important advantage in using a Q-sort to establish a value profile is that it allows for “holistic comparisons across multiple dimensions rather than sequential comparisons” (Cable and Judge, p 307, 1996), consistent with the manner in which person-organization fit is conceptualized.

Future research needs to extend the findings of this study by identifying the specific dimensions of Australian Antarctic station culture using a normative rather than idiographic measure of organizational culture. Further research is also needed to identify the extent to which Antarctic station culture is consonant with certain personality traits. Research exploring the role of personality is necessary in view of the expanding literature on: (i) job and organizational choice indicating that individuals are attracted to work environments that are compatible with their personal characteristics (Kristof, 1996; Judge and Cable, 1997); and (ii) value typologies appropriate for individuals and organizations, as an alternative to research on values congruence (Dawis, 1990; O'Reilly et al., 1991 Judge and Cable, 1997).

CHAPTER 5

Study IV

5.1 Introduction

This chapter presents the results of a quantitative study investigating the extent to which specific dimensions of Australian Antarctic station culture can be identified and measured. Part 1 identifies the behavioural norms and expectations that characterize Antarctic station culture, whilst Part 2 explores the impact of behavioural norms and expectations on individual job outcomes, including job fit, role clarity, role conflict and job satisfaction. Whilst the previous study focused on Antarctic station values, this study aims to identify the behaviour norms and expectations considered characteristic of Antarctic station culture.

Organizations based in isolated, confined and extreme environments have not been the focus of organizational research, and consequently, organizational theories derived from data collected in corporate or business settings may, or may not, be applicable to organizations in such environments (e.g., polar, undersea, or space habitats). In addition, although Antarctic stations are considered analogues of other extreme environments, including space stations and lunar facilities in which individuals may be similarly confined to small, isolated teams, the culture of Antarctic stations and groups in other similar isolated and extreme environments has not been explored. This study aims to (i) extend existing organizational research by providing empirical data on the behavioural norms of isolated and confined workstations in Australian Antarctica; and (ii) extend existing polar research by providing empirical data on the specific dimensions of Australian Antarctic culture over the last 50 years.

This study will quantitatively assess the culture of Australian Antarctic stations using the Organizational Culture Inventory (OCI; Cooke and Lafferty, 1989), which is one of the most widely used normative measures of organizational culture. The OCI assesses organizational behaviour norms and expectations within the context of two underlying dimensions: a concern for task versus people; and a need for security versus satisfaction (Rousseau, 1990a, 1990b). Prior research on the OCI has suggested that “ideal” organizations take the form of Satisfaction-oriented cultures with behavioural norms and expectations that correlate positively with positive job outcomes. Security-oriented cultures are characterized by behaviour inhibiting norms (e.g., risk avoiding) that correlate positively with negative job outcomes (Cooke and Rousseau, 1988; Rousseau, 1990a,

1990b; Cooke and Szumal, 1993; van der Velde and Class, 1995). The reader is referred to Chapter 1 for a more detailed outline of the Organizational Culture Inventory and additional information on the quantitative assessment of organizational culture.

This is exploratory research, so relatively few a priori hypotheses can be made regarding the specific behavioural norms and expectations considered characteristic of Australian Antarctic station culture. However, on the basis of the results of the previous three studies it is hypothesised that:

Hypothesis 1: Men and women will differ in their perceptions of the behavioural norms and expectations that characterize Antarctic station culture.

Hypothesis 2: The behavioural norms and expectations considered characteristic of the all-male era of Antarctic expeditions prior to 1980 will differ from those considered characteristic of expeditions from the mid 1980s onwards.

In addition, on the basis of past research on the OCI (e.g., Rousseau, 1990a, 1990b), it is hypothesised that:

Hypothesis 3: Satisfaction norms (e.g., Achievement, Self-Actualizing, Humanistic-Encouraging and Affiliative norms) will correlate positively with role clarity, job fit and job satisfaction, and negatively with role conflict and accommodation.

Hypothesis 4: Security norms (e.g., Approval, Conventional, Dependent, Avoidance, Oppositional, Power, Competitive, Perfectionism norms) will correlate positively with role conflict and accommodation, and negatively with role clarity, job fit and job satisfaction.

5.2 Method

5.2.1 Participants

The participants were 116 returned Australian National Antarctic Research Expeditioners (ANARE) who lived and worked on an Australian Antarctic or sub-Antarctic station²⁷ between 1950 and 1999. It was a mixed age group drawn from the sample used in the previous study, with ages ranging from 27 - 79 years. A total of 117 participants were approached to participate and all agreed. After agreeing, one participant indicated that he found the OCI too difficult to complete and returned it blank, leaving an available sample

²⁷In this study the sub-Antarctic comprised Macquarie Island only. References to "the Antarctic", "Antarctic stations" and "Antarctica" will hereinafter also include Macquarie Island station.

of 116.

The group comprised 14 women and 102 men. Of the total, 104 participants had lived and worked on an Antarctic station between 12 and 15 continuous months, including an Antarctic winter (“winterers”) and 12 had lived and worked on a station for up to 3 months over summer only (“summerers”). The group included station leaders, medical practitioners, chefs, scientists, researchers, meteorological technicians and trades and communications personnel. Table 5.1 contains demographic information on the group, including age, station position, year of their last expedition to Antarctic, and total number of expeditions per person. Additional demographic information, including a breakdown of this information by gender is presented in section 4.2.1 of the previous Chapter.

5.2.2 Measures

Behavioural norms and Expectations

The 96 item Organizational Culture Inventory (OCI; Cooke and Lafferty, 1989) was used to identify Antarctic station norms and expectations. The inventory measures norms and expectations that individuals believe they need to fulfil in order to “fit in” to an organization. It contains 96 items designed to produce 12 basic subscales comprising: Humanistic-Encouraging, Affiliative, Approval, Conventional, Dependent, Avoidance, Oppositional, Power, Competitive, Perfectionist, Achievement, and Self-Actualising. Each subscale consists of eight items, and each item describes a behaviour or personal style that might be expected of members in an organization.

Table 5.1: Demographic information for Study IV

	N	%
Gender		
Females	14	12.1
Males	102	87.9
Type of Expedition		
Winter	104	89.7
Summer only	12	10.3
Age (mean in years at time of interview)	54.57	-
Station Position		
Station leader	8	6.9
Medical Doctor	12	10.3
Chef	4	3.4
Scientist/Researcher/Field assistant	30	25.9
Trades	25	21.6
Meteorological technician/weather observer	21	18.1
Communications technician	16	13.8
Expedition Year (last)		
1950-59	12	10.3
1960-69	22	19.1
1970-79	23	19.8
1980-89	18	15.5
1990-99	41	35.3
No. of Expeditions (per person)		
1	50	43.1
2	38	32.8
3 or more	28	24.1

The 96-item OCI is a modified version of the original 120 item OCI developed by Cooke and Lafferty (1989). The 96-item OCI is increasingly preferred for research purposes because it contains fewer items, can be completed in less time, and is scored electronically (personal communication, R. Cooke, July 1999). In both versions of the

OCI, the 12 styles reflect two underlying dimensions: (i) *task* versus *people*; and (ii) *security* versus *satisfaction* (Rousseau, 1990a, 1990b). The dimensions distinguish the focus of specific norms and behaviours and the extent to which they are rewarded or inhibited by a group (Cooke and Rousseau, 1988). Consistent with these dimensions, the 12 styles can be categorized into three types of organizational cultures: (i) Constructive; (ii) Passive-Defensive; and (iii) Aggressive-Defensive. Empirical justification for grouping the 12 styles into the three factors is based on research conducted on the Life Styles Inventory (Cooke and Rousseau, 1983; Cooke Rousseau and Lafferty, 1987). The 12 subscales and the cultures they reflect are presented in Appendix E1. The three factors into which the 12 norms have been categorised are presented in Appendix E2.

The OCI employs a circumplex around which the 12 styles are placed. To avoid the possibility of social desirability bias, the OCI profiles are normatively scaled (Cooke and Rousseau, 1988, p. 260). The normed profile allows for a comparison of the occurrence of the 12 styles with other public, private, profit and non-profit organizations. The configurational model is characterized by a circular ordering of styles, with their proximity around the circumplex reflecting their expected degree of association (Cooke and Rousseau, 1988; Cooke and Szumal, 1993). Styles on the right side of the circumplex are associated with *people* needs whilst those on the left side are associated with *tasks*. The styles at the top reflect *satisfaction* needs whilst those at the bottom reflect *security* needs. The 12 styles were identified and positioned around the circumplex on the basis of personality research by Leary (1957), McClelland, Atkinson, Clark, and Lowell (1953), Rogers (1961), and Horney (1954). According to Cooke and Rousseau (1988), quantitative and qualitative evidence suggests that the styles reflect the direction and content of certain organizational norms and expectations (p. 252).

To complete the OCI, individuals are asked to read each of the 96 items and indicate the extent to which the behaviour described helps people to “fit in” and meet expectations in a given organization. Participants respond to the 96 items using a 5-point Likert scale ranging from 1 “Not at all” to 5 “To a very great extent” (e.g., to what extent were people required to conform?, and to what extent were people required to not the rock the boat?). The responses to the items associated with each style are added to produce a scale score. The higher the style score, the stronger the norms and expectations for behaviours

associated with that style. A copy of the OCI is at Appendix E3.

Outcome variables

Outcome variables comprised: role clarity, role conflict, job fit, accommodation, satisfaction, willingness to recommend and intention to return. The first six variables were assessed using the six single item subscales of the OCI. Participants respond to the items using a 5-point Likert scale ranging from 1 “Not at all” to 5 “To a very great extent” (see Appendix E4). Intention to return was assessed by the question “Would you be prepared to return again?” (1 = No, 2 = Yes). Since the maximum period of any single term in Antarctica is 15 months, this question was included to measure the extent to which participants were prepared to participate in future ANARE expeditions.

Control variables

Demographic variables, including age, gender, station position, type of expedition (whether an expeditioner was a “winterer” or “summerer”), and the year of participants’ last expedition to Antarctica were used as control variables.

5.2.3 Procedure

Each participant was forwarded the OCI and asked to complete it and return it using a reply paid envelope. All participants were encouraged to seek assistance by contacting the researcher if they had any difficulties with the OCI or if they had any queries about the study. Although one participant indicated that he had difficulty completing the OCI and subsequently returned it incomplete, no other queries about the OCI were received.

5.3 Results

The OCI was factor analysed using a principal components analysis with a varimax rotation to examine its underlying structure in terms of behavioural norms and expectations relevant to Antarctic stations. This approach is consistent with the conceptual model informing the inventory and past research on the OCI (Rousseau and Cooke 1988; Rousseau, 1990a; van der Velde and Class, 1995; and Xenikou and Furnham, 1996). Comparisons by age, gender, station position and other control variables were then undertaken using one-way analysis of variance, and the relationship between

perceived behavioural norms and the outcomes variables were assessed using correlations and multiple regression.

The internal reliability of the OCI was assessed using Cronbach's alpha (Cronbach, 1951). The results demonstrated good reliability for this sample with alpha coefficients ranging from .70 to .87, consistent with past OCI research (eg., Cooke and Rousseau, 1984, Cooke and Szumal, 1993, Xenikou and Furnham, 1996). Table 5.2 presents descriptive statistics for this sample.

TABLE 5.2
Descriptive statistics for the 12 OCI Subscales.

Subscale	Mean	S.D.	Alpha
(1) Humanistic-Encouraging	28.36	5.36	.85
(2) Affiliative	31.77	4.79	.87
(3) Approval	18.94	4.66	.74
(4) Conventional	22.20	5.02	.74
(5) Dependent	21.72	4.92	.75
(6) Avoidance	14.57	4.90	.82
(7) Oppositional	14.87	4.46	.75
(8) Power	14.35	4.40	.75
(9) Competitive	12.25	4.29	.82
(10) Perfectionistic	20.71	4.43	.70
(11) Achievement	28.31	4.81	.79
(12) Self-Actualizing	25.50	4.82	.77

N=116

N.B. Scale scores shown in the all tables and figures were derived by summing responses to the eight items that constitute each scale. These scores therefore have a potential range of 8 to 40.

The results of the principal-components analysis are presented in Table 5.3, along with results reported on a normative sample derived from a range of government and non-government, business and research organizations (Cooke and Rousseau, 1988). Consistent with the conceptual model underlying the 12 subscales, three factors were extracted accounting for 74% of the total variance. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.81, considered meritorious (Kaiser 1974).

As Table 5.3 indicates, although overall the 3-factor structure is consistent with the conceptual framework of the OCI, there are a number of variations in the pattern of loadings which need to be addressed. Consistent with past research, the Humanistic-Encouraging, Affiliative, Achievement and Self-Actualizing subscales all show loadings above .80 on a single factor (factor 1, referred to as Satisfaction or Constructive needs). It is interesting to note, however, that although the Oppositional, Power, and Competitive subscales loaded on factor 2 (referred to as Task-Security or Aggressive-Defensive needs), the Avoidance subscale also loaded on this factor, with a loading higher than the Perfectionistic subscale (.64 compared to .52). Other distinctive features of the present factor analysis include: (i) the loading of the Power subscale across Task-Security and factor 3, referred to as People-Security or Passive-Defensive norms (.68 and .52, respectively), and (ii) the loading of the Perfectionistic subscale across factors 1 and 2 (.51 and .50, respectively).

This pattern suggests that Avoidance, Power and Perfectionistic norms play a complex role as norms on Antarctic stations, and distinguish Antarctic station culture from the culture of corporate and business organizations. The pattern of results also suggests that on Antarctic stations avoidance behaviours (e.g., avoiding the possibility of blame for mistakes), are important within the context of station tasks (*task security*), whilst Power norms (e.g., the ability to take charge and build up one's power base) are important for maintaining good interpersonal relations (*people security*). The high loading of the Perfectionistic subscale on both Satisfaction and Task-Security, highlights that considerable value is placed on perfectionism and hard work.

TABLE 5.3
Rotated Factor loadings for the 12 OCI Subscales *.

OCI Subscales		Factor 1 "Satisfaction"		Factor 2 "Task-security"		Factor 3 "People-security"	
		<i>Australian Antarctic Expeditioners N=116</i>	<i>Cooke & Rousseau, (1988) N=604</i>	<i>Australian Antarctic Expeditioners N=116</i>	<i>Cooke & Rousseau (1988) N=604</i>	<i>Australian Antarctic Expeditioners N=116</i>	<i>Cooke & Rousseau (1988) N=604</i>
(1)	Humanistic-Encouraging	.85	.84	-.11	-.15	-.01	-.09
(2)	Affiliate	.85	.86	-.32	-.24	.15	.11
(3)	Approval	-.11	-.05	.34	.28	.74	.70
(4)	Conventional	-.04	-.25	.25	.32	.84	.79
(5)	Dependent	.06	.13	.12	.15	.85	.76
(6)	Avoidance	-.34	-.36	.64	.39	.40	.63
(7)	Oppositional	-.02	-.11	.80	.46	.16	.41
(8)	Power	-.07	.04	.68	.74	.52	.25
(9)	Competitive	-.10	-.06	.82	.77	.14	.19
(10)	Perfectionistic	.51	.07	.50	.63	.39	.36
(11)	Achievement	.87	.81	.06	.24	.21	-.22
(12)	Self-Actualizing	.88	.81	-.05	.13	-.05	-.15
Variance explained (%)		28.52	24.8	23.20	18.9	22.39	21.3
Cumulative variance explained		28.51	46.1	51.71	65.0	74.11	21.3

* Loadings above .50 are shown in bold.

In summary, the results of this factor analysis yielded two factors that are distinct from previous research (e.g., Cooke and Rousseau, 1988, van der Velde and Class, 1995; Xenikou and Furnham, 1996). In terms of this sample, factor 2 comprises Avoidance, Oppositional, Power and Competitive subscales, and factor 3 comprises Approval, Conventional, Dependent and Power subscales. The results suggest that the focus of behavioural norms and expectations on Australian Antarctic stations are distinct from those of corporate and business firms. Further research needs to explore the extent to which the present findings apply to other organizations in which individuals are required to work in isolated and confined settings for extended periods of time.

5.3.1 Perceived behavioural norms and expectations

The aggregated mean OCI scores were profiled using percentile scores. Figure 5.1 contains the OCI profile of Antarctic station culture according to the reports of returned Australian National Antarctic Research Expeditioners in this study. The normed profile allows for direct comparison of the occurrence of these styles on Antarctic stations and their occurrence in a range of other organizations. The numbers on the outer perimeter identify the 12 cultural styles and the six circles within the circumplex (from the inside out), represent the 10th, 25th, 50th, 75th, and 90th percentiles for each style. The further out on the profile a score, the stronger that cultural style in comparison with the normed population.

Overall, this profile reflects a strikingly Constructive or Satisfaction-oriented culture characterized by strong Humanistic-Encouraging, Affiliative and Achievement norms, which were all beyond the 50th percentile. The high Affiliative profile score indicates that expeditioners described Antarctic stations as open and friendly environments which emphasized constructive interpersonal relationships and the satisfaction needs of the group. The high Humanistic-Encouraging profile score suggests that Antarctic stations were managed in a participative and person-centred way, with members expected to be supportive, constructive and open in their dealings with one another. The high Achievement profile score suggests that Antarctic station culture values members who set themselves challenging and realistic goals and pursue these goals with enthusiasm. The Self-Actualizing profile score indicates that most participants described Antarctic stations as environments in which task accomplishment and personal growth are valued, and

expeditioners are encouraged to gain enjoyment from their work and develop themselves, consistent with the underlying conceptual model of Satisfaction-oriented cultures (Cooke and Rousseau, 1988).

The very low Competitive profile score (below the 10th percentile) and the low Power, Perfectionistic and Oppositional profile scores (both below the 25th percentile) suggest that in comparison to the normed population, Antarctic station culture was a strikingly low Task-oriented culture, with weak Task-Security norms. In addition, the low Competitive profile score indicates that Antarctic stations do not operate in a competitive “win-lose” framework; individuals are encouraged to work with one another rather than against one another and confrontational and oppositional behaviours are strongly avoided. The low Power, Oppositional and Perfectionistic profile scores suggest that Antarctic stations were described as participatory environments, rather than structured, hierarchical environments, and the weak People-Security norms suggest that little emphasis was placed on Approval, Dependent or Avoidance norms. Although the mean People-Security score is higher than the Task-Security score, it is nevertheless below the 50th percentile, indicating that Antarctic stations were generally described as less conservative than most organizations in the normative base.

5.3.2 Control variables

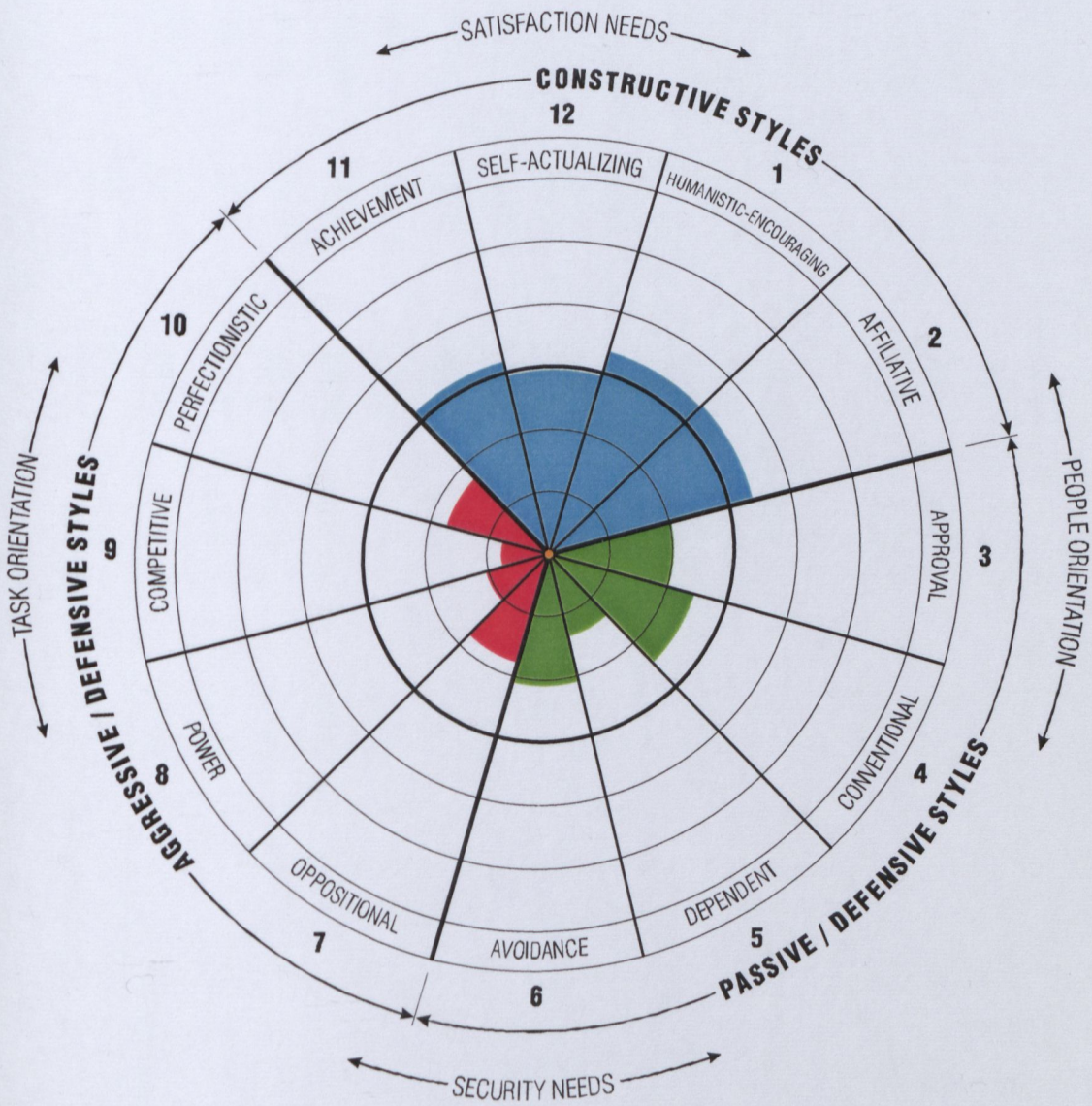
Gender

Hypothesis 1 predicted that different behavioural norms and expectations would be reported by men and women. To test for the effects of gender on the 12 behavioural norms and expectations a one-way analysis of variance was conducted and the results are presented in Table 5.4

All Participants

N = 116

Actual Culture Circumplex



Research and Development by
 Robert A. Cooke, Ph. D.
 J. Clayton Lafferty, Ph. D.
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Figure 5.1 OCI profile of Antarctic station culture (men and women).

TABLE 5.4
ANOVA of OCI Subscales and Factors by Gender.

Variable	Men N = 102		Women N = 14		F	p
	Mean	SD	Mean	SD		
Humanistic-Encouraging	28.74	5.01	25.64	7.13	4.19	.043*
Affiliative	31.98	4.53	30.29	6.37	1.54	.216
Approval	18.53	4.46	22.00	5.13	7.19	.008**
Conventional	21.68	4.78	26.07	5.25	10.17	.002**
Dependent	21.61	4.93	22.57	5.03	.47	.495
Avoidance	14.27	4.81	16.71	5.24	3.09	.081
Oppositional	14.74	4.42	15.93	4.80	.87	.351
Power	13.88	3.90	17.79	6.22	10.48	.002**
Competitive	12.22	4.32	12.50	4.29	.05	.818
Perfectionistic	20.67	4.39	21.07	4.92	.10	.750
Achievement	28.71	4.28	25.43	7.27	5.94	.016*
Self-Actualizing	25.95	4.47	22.29	6.11	7.52	.007*
Satisfaction	115.37	15.79	103.64	25.01	5.79	.017*
People-security	76.08	15.18	87.35	16.93	6.60	.011*
Task-security	61.50	13.45	67.28	15.80	2.18	.142

* $p < .05$, ** $p < .01$ (two tailed)

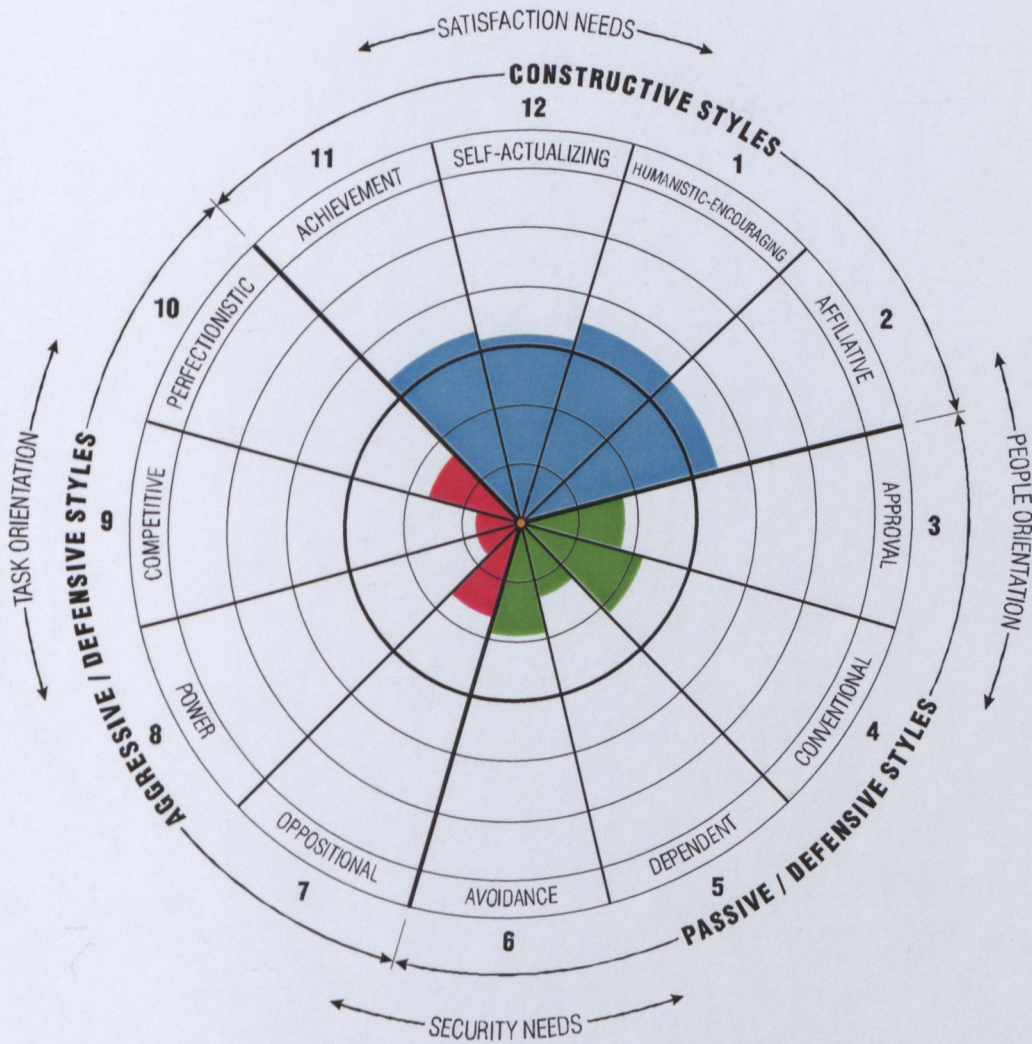
($df = 1, 114$)

Results indicate significant differences between men and women in terms of the Satisfaction subscales Humanistic-Encouraging ($F(1,114) = 4.19, p < .05$), Achievement ($F(1,114) = 5.94, p < .05$) and Self-Actualising ($F(1,114) = 7.52, p < .01$). Specifically, men achieved higher mean scores on these subscales, indicating that they perceived Antarctic station culture as significantly more Constructive and Satisfaction-oriented than did the women. In contrast, women achieved higher mean scores on the four Passive-Defensive subscales, with significantly higher scores for Approval ($F(1,114) = 7.19, p < .01$) and Conventional norms ($F(1,114) = 10.17, p < .01$). The results suggest that in describing Antarctic station culture, women referred to conformity, rules and pressure to fit into the “mold” significantly more than the men. Furthermore, as Table 5.4 indicates, women achieved higher mean scores on the four Task-Security norms, with significantly higher scores on the Power subscale ($F(1,114) = 10.48, p < .01$), suggesting that women described Antarctic station life as less participatory and more hierarchical than the men.

A comparison of the three factor scores revealed significant differences between men and women for Satisfaction ($F(1,114) = 5.79, p < .05$) and People-Security needs ($F(1,114) = 6.60, p < .05$), with women achieving higher People-Security scores and lower Satisfaction scores than the men. The results demonstrate that women referred to Antarctic station culture as a Passive-Defensive style culture with norms that focus on interpersonal relations and inhibiting norms and behaviours, whilst their male counterparts referred to it as a Satisfaction style culture with encouraging norms and behaviours. The results suggest that men described Antarctic station culture as more open and supportive environments, characterized by team work, cooperation and personal development, whilst women described them as highly conservative environments with pressure for members to conform, be agreeable, follow rules, and make a good impression in order to “fit in”. The one-way analysis of variance results are presented in Table 5.4 and gender differences in perceived norms are illustrated in separate circumplexes for the men and women (Figures 5.2 and 5.3, respectively).

Sex: Male
 N = 98

Actual Culture Circumplex



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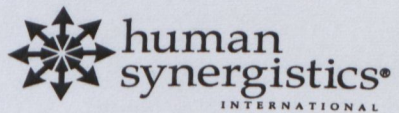
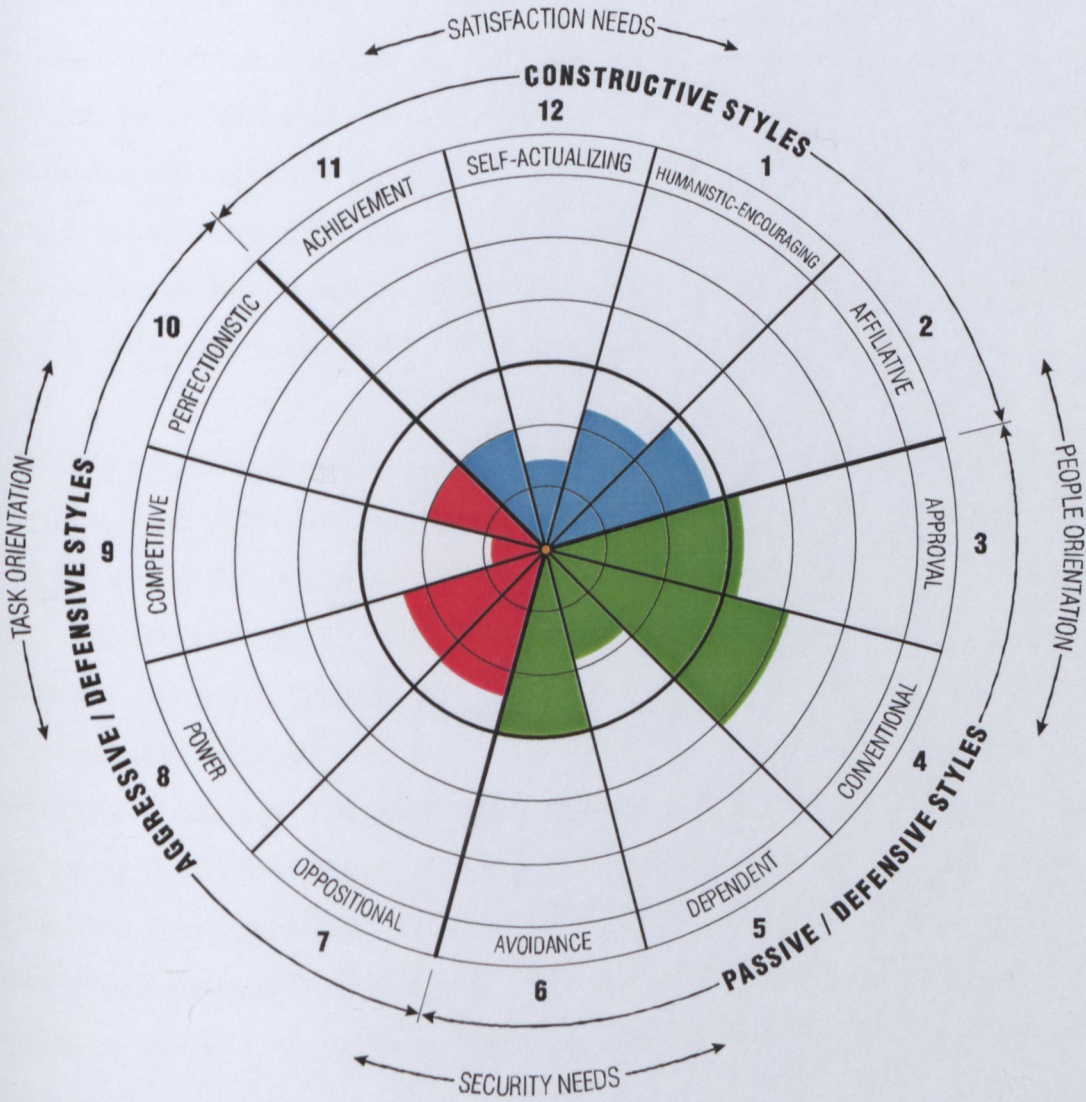


Figure 5.2 OCI profile for men

Sex: Female
 N = 14

Actual Culture Circumplex



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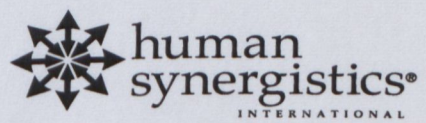


Figure 5.3 OCI profile for women

Expedition Year

Hypothesis 2 predicted that different behavioural norms and expectations would be reported by those who participated in all-male expeditions prior to 1980s, and those who participated in mixed expeditions from the 1980s onwards. In order to determine the extent to which descriptions of Antarctic station culture differed before and after 1980, a one-way analysis of variance was conducted and the results are presented in Table 5.5. Results demonstrate a significant difference for Satisfaction needs ($F(1,114) = 4.17, p < .05$) and significant differences for the Achievement ($F(1,114) = 8.51, p < .01$) and Self-Actualizing subscales ($F(1,114) = 4.29, p < .05$), with expeditions prior to 1980 described as more Satisfaction-oriented in terms of achievement and self-actualizing norms. There were no statistically significant differences between the groups in terms of People-Security and Task-Security needs and the remaining 10 OCI subscales.

In order to determine the extent to which perceptions of Antarctic station culture changed over time, mean OCI scores for men were compared across the five decades from 1950 to 1999 and the results are presented in Table 5.6. Table 5.6 shows a significant increase in mean Task-security scores from 1960-69 and 1970-79, and moderately significant differences between Competitive subscale scores (1960-69 and 1970-79) and Achievement subscale scores (1970-79 and 1990-99), suggesting that Antarctic station behavioural norms and expectations have changed over time. Interestingly, the results suggest that the 1970-79 decade was a significantly more competitive and achievement oriented era than the decades before or after. However, despite changes to Antarctic station culture over the five decades, there is no evidence of consistent increases in mean Satisfaction scores that would suggest that perceptions of Antarctic station culture improve with time.

TABLE 5.5
ANOVA of OCI Subscales and Factors by Expedition Year.

Variable	Pre 1980 N = 57		Post 1980 N = 59		F	p
	Mean	SD	Mean	SD		
Humanistic-Encouraging	29.03	5.08	27.71	5.59	1.77	.18
Affiliative	32.21	4.55	31.35	5.01	.92	.34
Approval	18.65	4.10	19.23	5.16	.46	.50
Conventional	21.28	4.59	23.10	5.28	3.90	.05
Dependent	21.94	4.94	21.50	4.93	.22	.63
Avoidance	13.79	3.92	15.32	5.63	2.87	.09
Oppositional	15.35	4.40	14.42	4.51	1.25	.26
Power	13.96	3.44	14.72	5.15	.87	.35
Competitive	12.43	4.41	12.06	4.20	.21	.64
Perfectionistic	21.26	4.26	20.18	4.56	1.72	.19
Achievement	29.60	4.00	27.06	5.22	8.51	.00**
Self-Actualizing	26.43	4.40	24.61	5.06	4.29	.04*
Satisfaction	117.28	15.42	110.74	18.78	4.17	.04*
People-security	75.66	13.41	79.17	17.67	1.43	.23
Task-security	63.01	12.48	61.40	15.04	.39	.53

* $p < .05$, ** $p < .01$ (two tailed)
($df = 1, 114$)

TABLE 5.6
Mean OCI Scores for Men by Decade.

Variable	1950-1959 n = 12		1960-1969 n = 22		1970-1979 n = 23		1980-1989 n = 15		1990-1999 n = 30		F	p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Humanistic-Enc.	26.00	6.10	29.00	4.50	30.65	4.46	28.00	5.23	28.53	4.88	1.91	.11
Affiliative	31.00	5.18	32.27	3.83	32.78	4.90	31.26	3.47	31.90	5.04	.42	.78
Approval	19.33	4.25	18.00	3.65	18.91	4.51	18.13	3.13	18.50	5.65	.24	.91
Conventional	21.66	5.63	20.00	3.36	22.30	4.93	22.00	3.48	22.26	5.66	.90	.46
Dependent	23.25	6.16	21.27	4.52	21.91	4.72	20.40	4.43	21.56	5.17	.59	.66
Avoidance	14.41	4.18	12.91	2.75	14.30	4.68	14.00	3.48	15.33	6.58	.81	.52
Oppositional	14.91	4.79	13.90	3.76	16.95	4.41	13.73	3.41	14.06	4.82	2.09	.08
Power	12.66	2.93	13.31	2.57	15.26	4.07	13.26	2.28	14.03	5.22	1.24	.29
Competitive	11.66	3.28	10.77^a	3.14	14.43^b	5.24	11.60	4.08	12.10	4.35	2.38	.05
Perfectionistic	22.33	4.79	19.54	3.86	22.34	3.97	20.40	3.54	19.66	4.90	2.13	.08
Achievement	27.83	3.35	29.63	4.59	30.47^a	3.55	28.33	4.43	27.20^b	4.39	2.46	.05
Self-Actualizing	25.33	4.25	26.45	5.16	27.00	3.73	26.06	4.38	24.96	4.63	.80	.52
Satisfaction	110.16	16.42	117.36	15.82	120.91	13.80	113.66	15.56	112.60	16.61	1.41	.23
People-security	78.66	16.61	72.18	11.32	77.43	13.32	74.53	11.38	77.66	19.70	.60	.65
Task-security	61.58	12.53	57.54^a	8.55	69.00^b	13.40	59.00	9.34	59.86	16.62	2.67	.03

N=102 (df = 1, 114)

^{ab} Indicates a statistically significant difference between a pair of mean scores (Tukey test result).

Station Position

A one-way analysis of variance was conducted to determine the extent to which descriptions of Antarctic station culture differed according to station position. Pair-wise comparisons between the groups were then undertaken using the Tukey test (Tukey, 1953).

The Tukey test is a well known *post hoc* test which is recommended for experimental situations in which a researcher is interested in conducting all possible pair-wise comparisons between group means (Keppel, 1991). The Tukey test is recommended over the Sheffe, the Dunnett and the Newman-Keuls *post hoc* tests for the purpose of controlling and maintaining the family-wise type I error rate for an entire set of pair-wise comparisons (Keppel, 1991).

The results of one-way analysis of variance indicate a significant difference between groups for the Power subscale ($F(6,106) = 3.01, p < .01$.) The Tukey test results demonstrate a significant difference ($p < .05$) between the mean Power subscale scores of station chefs/cooks and other occupational groups, namely scientists, trade workers, meteorological technicians and communications personnel. The results highlight that in comparison to other occupational groups, station chefs/cooks perceived Antarctic station culture as more non-participative and hierarchical. There were no significant differences between other occupational groups in this regard. Table 5.7 contains the results of these analyses.

Age

To test for the effect of age, mean scores on the 12 OCI subscales were compared across age groups. Results of the one-way analysis of variance indicate a significant difference between mean scores on the Achievement subscale ($F(4,111) = 3.24, p = .01$). In particular, the results of the Tukey *post hoc* test indicate a significant difference between the 40-49 year and 60 plus age groups, with 40-49 year olds describing Antarctic station culture as less achievement oriented than the older group. Interestingly, a similar difference was identified between the mean Achievement scores of 40-49 year olds and the 20-29 year olds. However, due to the small sample size of the younger age group the difference was not statistically significant. Overall, these results highlight some

differences in the perception of Antarctic station behavioural norms and expectations over time. The analysis of variance results are presented at Table 5.8.

Expedition Type

A one-way analysis of variance was conducted to determine the extent to which summerers and winterers described Antarctic station culture differently. The results indicate a significant difference between groups in terms of the Affiliative subscale ($F(1,114) = 4.74, p < .05$), with summer expeditioners achieving a higher mean Affiliative subscale score. This trend occurred across the remaining three Satisfaction subscales, though differences between mean scores were not statistically significant. The results indicate that individuals who participated in summer expeditions only (summerers) described Antarctic station culture as more open and friendly than those who participated in winter expeditions (winterers), suggesting that station culture changes, to some extent, with the arrival and departure of expeditioners each year. The analysis of variance results are presented at Table 5.9.

TABLE 5.7
ANOVA of OCI Subscales and Factors by Station Position.

Variable	Station Leaders		Medical Practitioners		Cooks/Chefs		Scientists		Trade workers		Meteorological Technicians		Communications Technicians.		F	p
	N = 8		n = 12		n = 4		n = 27		n = 25		n = 21		n = 16			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Humanistic-Enc.	31.25	3.41	25.91	6.30	27.50	7.76	27.07	5.25	30.24	4.46	28.19	5.69	28.06	5.61	1.61	.15
Affiliative	33.62	3.16	28.41	7.14	32.75	6.23	31.26	4.91	32.68	4.26	32.14	4.30	32.12	4.08	1.44	.20
Approval	20.25	3.10	19.41	8.05	23.50	6.24	18.81	3.67	18.24	4.67	17.52	3.75	20.25	3.92	1.40	.22
Conventional	22.50	5.23	21.91	6.25	28.75	6.23	22.51	4.51	21.00	5.79	21.61	3.95	22.81	4.07	1.50	.18
Dependent	21.87	4.82	18.83	4.64	26.75	7.50	22.66	5.45	21.60	4.38	20.38	4.23	23.12	4.31	2.13	.05
Avoidance	13.75	4.83	16.50	6.69	18.25	7.84	14.81	5.02	13.48	4.27	13.19	3.88	15.75	4.02	1.41	.21
Oppositional	15.75	3.37	16.33	6.74	19.25	5.73	14.37	3.55	13.52	3.50	13.85	3.87	16.56	5.20	2.00	.07
Power	14.37	2.72	16.33	7.10	21.75^a	8.54	13.92^b	3.08	13.88^b	3.52	12.95^b	4.10	14.31^b	3.17	3.01	.01*
Competitive	11.75	11.98	12.58	6.00	15.50	8.58	11.51	3.08	12.12	4.23	11.85	4.04	13.37	4.48	.76	.60
Perfectionistic	20.75	3.99	19.16	5.25	21.75	5.96	21.51	4.27	21.36	4.05	18.95	4.05	21.43	5.08	1.12	.35
Achievement	30.25	2.71	26.33	6.73	23.50	8.34	27.96	5.19	29.92	3.55	27.47	3.95	28.87	4.58	1.89	.08
Self-Actualizing	25.75	2.86	23.58	6.55	23.75	6.85	25.44	5.40	25.76	4.31	25.57	4.85	26.75	3.96	.58	.74
Satisfaction	120.87	8.44	104.25	24.67	107.50	26.88	111.74	18.75	118.60	13.64	113.38	16.61	115.81	16.04	1.31	.25
People-security	78.37	12.89	76.66	19.92	97.25	25.51	78.81	15.67	74.32	15.87	72.71	12.85	81.93	11.18	1.88	.09
Task-security	62.62	10.12	64.41	20.85	78.25	25.67	61.33	10.20	60.88	11.47	57.61	11.50	65.68	15.09	1.63	.14

* $p < .05$, ** $p < .01$ (two tailed), $N=113$ ($df = 6, 106$)(category for scientists excludes 3 field assistants)

^{ab} Indicates a statistically significant difference between a pair of mean scores.

TABLE 5.8
ANOVA of OCI Subscales and Factors by Age.

Variable	20-29 yrs		30-39 yrs		40-49 yrs		50-59 yrs		60 +		F	p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Humanistic-Encouraging	30.57	1.61	27.72	6.17	28.10	6.76	28.85	3.56	28.15	5.64	.45	.76
Affiliative	34.14	3.48	30.52	4.83	31.84	6.36	32.37	3.18	31.71	4.99	.96	.43
Approval	17.42	4.19	18.84	4.32	20.15	6.98	18.51	4.12	19.00	3.93	.56	.69
Conventional	21.57	4.27	22.32	5.25	24.58	5.35	21.26	4.68	21.73	4.93	1.43	.22
Dependent	19.28	2.43	21.04	5.44	21.42	5.17	21.33	4.53	23.05	4.93	1.31	.27
Avoidance	14.14	4.33	15.48	5.95	15.10	5.99	14.48	4.54	13.84	3.95	.48	.74
Oppositional	13.42	1.51	14.32	4.10	14.89	5.43	14.29	4.34	15.92	4.59	.91	.46
Power	13.57	3.10	13.92	4.42	16.36	7.09	13.77	3.56	14.18	3.14	1.25	.29
Competitive	12.28	3.73	12.16	4.43	12.58	5.18	11.77	4.21	12.47	4.07	.13	.97
Perfectionistic	22.00	3.46	19.80	3.88	19.31	5.43	21.07	4.25	21.52	4.43	1.26	.29
Achievement	30.71	3.50	27.08	4.58	25.63^a	6.92	29.29	3.48	29.31^b	4.14	3.24	.01
Self-Actualizing	27.28	4.19	24.40	5.26	24.00	6.38	26.14	3.09	26.21	4.62	1.37	.24
Satisfaction	122.71	11.45	109.72	18.65	109.58	24.55	116.66	10.31	115.39	16.97	1.35	.25
People-security	72.42	11.02	77.68	18.34	81.26	19.13	75.59	15.23	77.63	13.34	.54	.70
Task-security	61.28	6.94	60.20	13.13	63.15	19.81	60.92	13.77	64.10	11.85	.39	.81

N=116 (df = 4, 111)

^{ab} Indicates a statistically significant difference between a pair of mean scores.

TABLE 5.9
ANOVA of OCI Subscales and Factors by Expedition.

Variable	Winterers N = 104		Summerers N = 12		F	p
	Mean	SD	Mean	SD		
Humanistic-Encouraging	28.10	5.45	30.58	4.14	2.31	.13
Affiliative	31.45	4.78	34.58	3.94	4.74	.03
Approval	19.01	4.80	18.41	3.31	.17	.67
Conventional	22.06	5.11	23.41	4.07	.77	.38
Dependent	21.70	5.02	21.91	4.12	.02	.88
Avoidance	14.76	5.01	12.91	3.58	1.52	.22
Oppositional	15.03	4.53	13.50	3.63	1.28	.26
Power	14.45	4.57	13.50	2.39	.50	.48
Competitive	12.47	4.44	10.33	1.97	2.70	.10
Perfectionistic	20.60	4.38	21.66	4.92	.61	.43
Achievement	28.13	4.88	29.83	4.01	1.34	.25
Self-Actualizing	25.31	4.82	27.16	4.66	1.59	.21
Satisfaction	113.01	17.52	122.16	15.07	3.01	.08
People-security	77.53	16.14	76.66	12.45	.03	.85
Task-security	62.56	14.08	59.00	11.10	.71	.40

N=116 (df = 1, 114)

5.3.3 Station subcultures

The results of this study indicate a strong male dominated culture on stations with consensus among the majority of expeditioners (who were men) regarding Antarctic station norms and expectations. However, differences in the norms and expectations reported by women and cooks/chefs provide some evidence for the existence of station subcultures (Martin and Siehl, 1983). In particular, differences in perceptions of station culture by men and women in this study are consistent with the findings of the first two qualitative studies in this thesis and the previous quantitative study (refer to Chapter 4). The results also indicate a lack of total group consensus regarding Antarctic station norms and expectations, with women reporting different norms and expectations compared to men, and cooks/chefs reporting different norms and expectations to other occupational groups on stations. These results are consistent with the findings of Rousseau (1990a), that indicated that members of the same organization may experience divergent priorities and outcome preferences²⁸. These results are also consistent with other past research suggesting that within a single organization behavioural norms can operate at a subgroup level (Schneider and Reichers, 1983; Cooke and Rousseau, 1988; Rousseau, 1990b). For example, Cooke and Rousseau (1988) found that the organizations they surveyed were strongly subcultural by function (eg., marketing versus production) and according to organizational level. Norms supporting achievement, personal initiative, and team work characterized higher organization levels, whilst norms supporting conflict avoidance, competition, and dependence characterized lower levels.

Differences in the behavioural norms and expectations reported by expeditioners who participated in all-male expeditions before 1980 and those who participated in mixed gender expeditions from 1980 onwards indicate that the OCI has identified changes in station behavioural norms and expectations over time.

5.3.4 Outcome Variables

Means, standard deviations and correlations between outcome variables and the three OCI culture factors appear in Table 5.10.

²⁸ The reader is referred to Rousseau (1990a) for a discussion of uniformity and mutuality in descriptions of culture using the OCI, and the importance of combining quantitative and qualitative research results

A number of correlations were found between outcome variables and the three culture factor scores. The positive correlations between the Satisfaction factor and role clarity ($r=.23$, $p<.05$), fit ($r=.41$, $p<.001$), satisfaction ($r=.53$, $p<.001$), willingness to recommend ($r=.23$, $p<.01$), and intention to return ($r=.18$, $p<.05$), indicate that Satisfaction-oriented norms (Achievement, Self-Actualizing, Humanistic-Encouraging and Affiliative) correlate positively with clear job expectations, job fit, job satisfaction, willingness to recommend Antarctica to others, and the intention to return to the Antarctic again. In contrast, Satisfaction-oriented beliefs correlated negatively with perceived role conflict ($r=-.43$, $p<.001$). The results support hypothesis 3 that Satisfaction needs correlate positively with desirable job outcomes and negatively with undesirable job outcomes, namely role conflict.

As Table 5.10 indicates, People-Security norms (Approval, Conventional, Dependent, Avoidance), correlate positively with role conflict ($r=.35$, $p<.001$) and accommodation ($r=.24$, $p<.05$), and negatively with fit ($r=-.31$, $p<.01$) satisfaction ($r=-.24$, $p<.05$) and willingness to recommend ($r=-.23$, $p<.05$), suggesting that some adverse experiences are associated with this style. It is also interesting to note that Task-Security norms (Oppositional, Power, Competitive Perfectionistic) correlated positively with role conflict ($r=.30$, $p<.01$) and accommodation ($r=.26$, $p<.01$), negatively with fit ($r=-.24$, $p<.05$) but were not significantly related to satisfaction, role clarity or intention to return. Role conflict refers to the degree to which individuals believed they received inconsistent messages regarding what was expected. Accommodation refers to the extent to which individuals believed that their work in Antarctica required them to think and behave differently than would otherwise be the case. These patterns suggest that Security-oriented norms tend to correlate negatively with fit, which is a desirable job outcome, and positively with undesirable outcomes, such as role conflict and accommodation.

In order to determine the extent to which perceptions of Antarctic station culture predicted the various job outcomes, multiple regression analyses were conducted using the three OCI factor scores as independent variables and the results of the analyses are presented in Table 5.11. The Satisfaction factor positively and significantly predicted job fit ($p<.001$), job satisfaction ($p<.001$), role clarity ($p<.05$), willingness to recommend ($p<.05$) and intention to return ($p<.05$), and negatively predicted role conflict ($p<.001$),

suggesting that Satisfaction-oriented cultures have a positive impact on desirable job outcomes, consistent with previous research using the OCI (Rousseau, 1990a, 1990b).

As Table 5.11 indicates, People-Security factor positively and significantly predicted role conflict ($p < .001$) and accommodation ($p < .01$), and negatively predicted fit ($p < .01$), satisfaction ($p < .05$) and willingness to recommend Antarctica to others ($p < .05$). The Task-Security factor positively and significantly predicted conflict ($p < .01$), job fit ($p < .01$) and accommodation ($p < .01$). Consistent with past research on the OCI (eg., Cooke and Rousseau, 1988; Rousseau, 1990a, 1990b; van der Velde and Class, 1995), the results show that in contrast to Satisfaction-oriented cultures, Security-oriented cultures positively impact on adverse workplace outcomes, such as conflict and accommodation, and negatively impact on desirable outcomes, such as job satisfaction, role clarity, job fit and willingness to recommend.

TABLE 5.10
Means, Standard deviations, and Correlations between Outcome Variables and 3 OCI groupings.

Variable	N	Mean	S.D.	Satisfaction	People Security	Task Security
1. Role clarity	107	4.23	.85	.23*	-.15	-.05
2. Role conflict	107	1.88	1.00	-.43**	.35**	.30**
3. Fit	108	4.18	.82	.41**	-.31**	-.24*
4. Accommodation	107	2.51	1.21	-.05	.24*	.26**
5. Satisfaction	107	4.52	.74	.53**	-.24*	-.10
6. Recommend	100	3.98	1.37	.23*	-.23*	-.14
7. Intention to return (1=No, 2=Yes)	116	1.18	.39	.18*	.00	-.03

* $p < .05$, ** $p < .01$ (two tailed)

TABLE 5.11
Multiple Regression of Culture Styles on Outcome Variables.

Variable	Satisfaction			People Security			Task Security		
	R^2	F	p	R^2	F	p	R^2	F	p
Role Clarity	.05	6.14	.01*	.02	2.56	.11	.00	.34	.56
Role Conflict	.19	24.98	.00**	.12	14.66	.00**	.09	10.72	.00**
Fit	.17	21.87	.00**	.09	11.55	.00**	.06	6.97	.01*
Accommodation	.00	.26	.60	.06	6.93	.00**	.07	7.79	.00**
Satisfaction	.28	40.98	.00**	.05	6.51	.01*	.01	1.20	.27
Recommendation	.05	5.52	.02*	.05	5.72	.01*	.02	2.06	.15
Intention to Return (1=No, 2=Yes)	.03	4.05	.04*	.00	.00	.97	.00	.15	.70

* $p < .05$, ** $p < .01$ (two tailed)

5.4 General Discussion

The overall group profile of Antarctic station culture reflects a striking Satisfaction style culture, with the majority of participants describing Antarctic stations as open, friendly and participatory environments with Constructive norms and behaviours. However, the results also revealed striking gender differences in perceptions of Antarctic station norms. Although the majority of participants (who were men) described Antarctic station culture as open and team-orientated, women described it as highly conventional, rule oriented, hierarchical and non-participatory. More specifically, whilst men perceived Antarctic station culture as “ideal”, women perceived it as behaviour-inhibiting and highly controlling, a feature demonstrated in high reliability Security-oriented cultures in organizations such as Naval Air Squadrons and aircraft carriers deck operations (the reader is referred to Rousseau and Cooke, 1988 and Rousseau, 1989 for information on high reliability organizations). Overall, the results are consistent with the identification of gender differences in the previous three studies of this thesis, and support the hypothesis that men and women differ in their perceptions of Australian Antarctic station culture.

The hypothesis that different behavioural norms and expectations would be reported by those who participated in all-male expeditions prior to the 1980s and those who participated in mixed expeditions during the 1980s and 1990s was also supported, with expeditions in the pre-1980 era described as more open and friendly. This finding is consistent with the proposition that two distinct eras of Antarctic station culture existed between 1950 and 1999: the all-male era of ANARE prior to 1980 when the culture was created and when expeditions were more homogenous, and the two decades of mixed expeditions since that time. Differences in perceived norms and expectations across the two eras may reflect changes to Antarctic station culture associated with the administrative, logistic and recruitment changes to ANARE during the 1980s, including: changes to communication; technological advances; the station rebuilding program and the influx of construction workers; and the recruitment of women on a more regular basis. The results of the first qualitative study in this thesis suggest that these changes had a dramatic impact on Antarctic station life and culture. Interestingly, the results of this investigation also showed that the 1970-79 decade, in particular, was perceived as significantly more competitive and achievement oriented era than other decades.

In addition to gender differences in the perception of Antarctic station culture, the results of this study revealed differences in the perception of station culture according to: (i) expedition type, with summerers describing station culture as more open and friendly than winterers; and (ii) station position, with cooks/chefs describing Antarctic station culture as significantly more hierarchical and non-participatory than other team based groups. The results are consistent with the work demands of cooks/chefs who, as an occupational group, work longer hours and receive lower pay than all other paid ANARE positions. The results also suggest that Antarctic station culture changes, to some extent, with the arrival and departure of summer expeditioners each year, and that different behavioural norms and expectations exist across some occupational groups. These findings are consonant with past research on the OCI demonstrating the existence of subcultures according to hierarchical level (Cooke and Rousseau, 1988) and organizational function (Rousseau, 1990a).

Consistent with past research (e.g., Rousseau, 1990a, 1990b) participants' perceptions of Antarctic station culture significantly predicted their perceived role clarity, job fit, job satisfaction, intention to return, and willingness to recommend Antarctica to others. Specifically, consistent with hypothesis 3, Satisfaction norms (Achievement, Self-Actualizing, Humanistic-Encouraging and Affiliative) correlated positively with role clarity, job fit and job satisfaction, intention to return, and willingness to recommend, and negatively with role conflict. Security norms (Approval, Conventional, Dependent, Avoidance, Oppositional, Power, Competitive, perfectionism) correlated positively with role conflict and accommodation and negatively with role clarity, job fit and job satisfaction, and willingness to recommend, supporting hypotheses 4.

Implications

This study identified the behavioural norms and expectations considered characteristic of Australian Antarctic stations over the last 50 years of ANARE. The study also assessed the impact of behavioural norms and expectations on job outcomes, including job fit, role clarity, role conflict and job satisfaction. By identifying and measuring the behavioural norms and expectations of isolated and confined station populations/groups in Australian Antarctica, this study has extended existing polar research and added generalizability to

past research on the quantitative assessment of organizational culture using the OCI. According to past theoretical research (Rousseau, 1989, 1990a) although values and behaviours can be expressed in similar terms they are distinct cultural elements, since expressing a preference for a certain value (eg., creativity) and actually supporting and rewarding it are distinct social phenomena. On the basis of previous theoretical research, therefore, this research has extended the results of the previous study (refer to Chapter 4), which investigated Antarctic station values by: (i) exploring another layer of Antarctic station culture; and (ii) identifying specific dimensions of Antarctic station culture.

In summary, the results of this investigation showed significant gender effects on perceptions of Antarctic station culture within the context of the two underlying dimensions: a concern for task versus people and a need for security versus satisfaction. In particular, whilst men referred to Antarctic station culture as a strong Satisfaction-oriented culture characterized by norms and expectations for Humanistic-Encouraging, Affiliative, Achievement and Self-Actualizing norms, women described it as highly conventional, rule oriented and characterized with controlling rather than supportive interpersonal behaviour. Consistent with the previous study, the findings provide evidence for the existence of Antarctic station subcultures²⁹, with women expeditioners reporting different behavioural norms and expectations to the dominant male group on Australian Antarctic stations. The results of this investigation also indicated that cooks/chefs reported different behavioural norms and expectations than other occupational groups, suggesting the existence of occupational subcultures.

These findings are consistent with past research on the OCI which identified differences in perceptions of culture by members of the same organization (eg., Rousseau, 1989; Cooke and Rousseau, 1990a). Results of this investigation also revealed changes to Antarctic station culture over time, with different behavioural norms reported by those who participated in all-male expeditions prior to 1980, and those who participated in mixed expeditions from 1980 onwards. Although past research has investigated the extent to which different behavioural norms and expectations are reported by members of

²⁹Refer to section 1.1.3 of Chapter 1 on the classification of organizational subcultures (Martin and Siehl, 1983).

the same organization, changes in behavioural norms and expectations over time, within a single organization, have not been previously explored.

Limitations & Future research

This study has several limitations that should be acknowledged. First, the study has focused on participants' perceptions of Antarctic station culture in terms of reported behavioural norms and expectations, rather than "actual norms and expectations" (i.e. as determined by independent observers). Second, although, the OCI is a normative rather than ipsative measure, it is still a quantitative method of assessing culture that uses set response choices that may constrain participants' responses (Williams and Brown, 1994). It is important to note, however, that the advantage of using quantitative methods is that by their nature, they facilitate large scale studies of organizational culture, including comparisons across organizations and replication. A third possible limitation relates to the focus of this investigation on returned expeditioners' perceptions of Antarctic station culture, which it may be argued may improve over time. However, results showed that this is not a valid concern because although perceptions of Antarctic station norms and expectations were shown to change over time, there was no evidence to suggest that they actually improved with time.

The results of this investigation suggest that behavioural norms and expectations are amenable to quantitative assessment and highlight the benefits of using a normative measure such as the OCI to supplement the qualitative study of organizational culture. However, future research needs to extend the findings of this study by determining: (i) the extent to which the behavioural norms and expectations that characterize Australian Antarctic stations also characterize other groups in isolated, confined and extreme environments; and (ii) the extent to which perceptions of Antarctic station culture are consonant with certain personality traits.

CHAPTER 6

Study V

6.1 Introduction

This chapter presents the results of a study on the personality of the Australian Antarctic expeditioner. The study will compare the general personality characteristics of Australian Antarctic expeditioners to a normative population. It will also examine: (i) the relationship between personality and perceived fit into Australian Antarctic station culture; (ii) the extent to which perceptions of Antarctic station behavioural norms and expectations are consonant with certain personality traits; and (iii) the relationship between personality and individual job outcomes in Antarctica.

Past research on the personality of Antarctic expeditioners has focused on the identification of characteristics associated with maladjustment to the extreme environmental conditions of Antarctica (Butcher and Ryan, 1974; Gunderson and Nelson, 1965; Owens, 1966; 1967a; 1967b; 1968). Some past research has suggested that adjustment to Antarctica is a function of narrow interests and a low need for stimulation (Biersner and Hogan, 1984), and that extraverts are less successful at adapting to the environment than more quiet, independent introverts (Palmai, 1963; Gunderson, 1966). In contrast, more recent research suggests that Antarctic personnel are generally well adjusted, more extraverted, open, agreeable and conscientious than normative groups (Steel, Suedfeld, Peri and Palinkas, 1997), perhaps reflecting the effect of expeditioner selection procedures.

A principal function of expeditioner selection procedures is to screen-out individuals considered mentally unfit for Antarctic duties. For instance, within the context of Australian National Antarctic Research Expeditions (ANARE), selection and recruitment procedures over the past three decades have included a psychological interview specifically designed to identify applicants at risk of: (i) not performing their job effectively; (ii) not coping with their period of service in the Antarctic; or (iii) conducting themselves in a manner likely to disrupt the social operation of the Antarctic station to which they were assigned (Kelly, 1995). On the basis of such expeditioner selection and screening procedures, one would expect today's Antarctic personnel to be highly skilled, well adjusted, and emotionally and behaviourally competent.

Past research on individual adjustment to Antarctic station life has addressed many noteworthy issues, including psychological and physiological symptoms associated with prolonged exposure to the physical Antarctic environment (eg., Gunderson, 1968; Strange and Youngman 1971; Palinkas, 1989, 1991, 1992; Palinkas and Browner, 1995; Palinkas, Johnson, Boster and Houseal, 1998), the relationship between individual personality traits and adjustment (eg., Palmi, 1963; Gunderson and Nelson, 1965; Strange and Youngman, 1971; Natani and Shurley, 1974; Biersner and Hogan, 1984; Steel et al., 1997), the risk of injury (Lugg, Gormly and King, 1987; Burns and Sullivan, 2000), the occurrence of positive and negative events (Wood, Hysong, Lugg and Harm, 2000) and the social environment of Antarctic stations (eg., Lantis, 1968; Natani and Shurley, 1974; Taylor, 1974; Robertson, 1988; Palinkas, 1990). However, a number of gaps remain in the literature that need to be highlighted.

The majority of past Antarctic research on adjustment is limited due to: (i) the use of small samples sizes, frequently single sex (all-male) groups; (ii) differences in the occupational composition of expeditions across international Antarctic stations that limit the generalizability of results; and (iii) the negative fit “pathogenic” approach of past research (Steel et al., 1997, p. 326) which has focused on individual psychological and cognitive problems considered detrimental to human adjustment and performance in Antarctica. Whilst past Antarctic research has identified the personality characteristics of expeditioners, the relationship between personality and perceived fit into Antarctic station culture has not been investigated. In addition, although past selection-orientated studies have focused on elements of individual job outcomes, the extent to which job attitudes and outcomes are positively or negatively affected by expeditioners’ perception of Antarctic station culture and their perceived fit with it, has not been explored.

Past research on person-culture fit suggests that an individual’s work values are determined by a variety of factors, including country of birth (Hofstede, 1980), education and career choices (Kohn and Schooler, 1978,) and organizational socialization experiences (Chatman, 1991; Judge and Cable, 1997). Research has also suggested that individuals are attracted to work environments that match their personal characteristics (Holland, 1985; Kristof, 1996) and their preferred organizational values (Judge and Cable, 1997). Importantly, however, the bulk of existing research on person-culture fit has

focused on the preferred organizational values of job recruits and individuals in business settings, which may or may not be applicable to groups in isolated, confined and extreme environmental settings. In view of the results of the previous study highlighting an association between perceptions of Antarctic station culture and individual job outcomes (refer to Chapter 5), research exploring the relationship between personality and perceptions of Antarctic station culture is needed to improve our understanding of Antarctic station culture, and its impact on individual adjustment to Australian Antarctic station life.

Using the NEO PI-R (Costa and McCrae, 1992), this study aims to contribute to existing Antarctic research on human adjustment by further exploring the general personality traits of Australian Antarctic expeditioners over the last 50 years of ANARE. The study also aims to contribute to existing organizational research by exploring: (i) the relationship between personality and perceptions of Antarctic station culture; (ii) the extent to which subjective and objective person-culture fit is consonant with certain personality traits; and (iii) the relationship between personality and job attitudes and outcomes.

On the basis of recent research on the personality of Antarctic expeditioners (eg., Steel et al., 1997) it is hypothesized that:

Hypothesis 1: In comparison to the normative group, Australian Antarctic personnel will score lower on Neuroticism and higher on the Extraversion, Openness, Agreeableness, and Conscientious factors.

On the basis of past research on person-culture fit (e.g., Judge and Cable, 1997), it is hypothesised that:

Hypothesis 2: Personality will affect perceptions of Antarctic station behavioural norms and expectations.

Hypothesis 3: Personality will affect perceived fit with Antarctic station culture.

Hypothesis 4: Personality will affect individual job outcomes, including job satisfaction, role conflict, role clarity, and accommodation.

6.2 Method

6.2.1 Participants

The participants were the same group used in the previous study. The group comprised 116 returned Australian National Antarctic Research Expeditioners (ANARE) who lived and worked on an Australian Antarctic or sub-Antarctic station between 1950 and 1999. A detailed outline of participants' demographic characteristics is presented in Section 5.2.1 of Chapter 5.

6.2.2 Measures

Apart from the personality data, data presented here are the same as those used in the previous two studies (Chapters 4 and 5), consequently, only a brief summary of other measures is presented below.

Personality

The Revised NEO Personality Inventory (NEO PI-R; Costa and McCrae, 1992) was used to provide a comprehensive assessment of the major factors of Personality. The NEO PI-R is based on a 5 factor model of personality (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness), often referred to as the "Big Five" (Goldberg, 1990; De Raad, 1998), that also measures some of the more important facets that define each of the 5 domains (Costa and McCrae, 1992). The five-factor structure has been shown to generalize across cultures and rating formats (self, peer, observer and stranger ratings) and there is evidence that the "Big Five" are heritable and stable over time (Costa and McCrae, 1992). A description of the five domains measured by the NEO PI-R is presented in Appendix F1.

The NEO PI-R is a measure of normal personality traits that has demonstrated utility in clinical and research settings. It consists of 240 statements answered using a 5-point scale (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree). The 240 statements are presented in an eight-page booklet which includes instructions and an answer sheet. Participants are asked to read the instructions and then mark their responses on the answer sheet, which contains areas for recording basic demographic information, responses to the 240 statements, and 3 additional validity check items.

The five domains of the NEO PI-R are represented by six more specific Facet scales that measure each domain. Examination of the Facet scales can provide a more detailed analysis of persons or groups, since meaningful differences can be seen identified within domains (Costa and McCrae, 1992). A description of the six Facet scales that measure each domain is presented in Appendix F2.

Behavioural norms and expectations

Data on behavioural norms and expectations were gathered using the 96 item Organizational Culture Inventory (OCI; Cooke and Lafferty, 1989). Briefly, the OCI measures norms and expectations that individuals believe they need to satisfy in order to “fit in” to an organization. It contains 96 items designed to produce 12 basic subscales comprising: Humanistic-Encouraging, Affiliative, Approval, Conventional, Dependent, Avoidance, Oppositional, Power, Competitive, Perfectionist, Achievement, and Self-Actualising. Refer to Section 5.2.2 of Chapter 5 for a detailed outline of the properties of the OCI.

Person organization fit

Data on person-organization fit were gathered using the Organizational Culture Profile (OCP; O’Reilly et al., 1991). Briefly, the OCP employs a Q-sort technique and contains 54 value statements derived from a review of research on organizational values and culture (Chatman, 1991). The OCP has been advocated as a quantitative method of assessing an employee’s fit within the context of an organization’s culture (Chatman, 1989, 1991; O’Reilly et al., 1991; Cable & Judge 1996). Appendix D4 contains the 54 OCP values.

Participants completed the OCP twice. First, they were asked to sort the 54 values to indicate the extent to which the values were characteristic of the culture of Australian Antarctic station. Two months later, participants were asked to sort the 54 values again, to arrive at a description of their ideal organization. A person-organization fit (P-O fit) score was obtained by calculating the difference between the two profiles assessed with the OCP. Specifically, the absolute difference between an individual’s perception of Antarctic station culture (OCP -Time 1) and their organizational preferences (OCP-Time

2) across the set of 54 items, measured P-O fit. Additional information on the OCP and the procedure used in this study is presented in Section 4.2.2 of Chapter 4.

Subjective fit

Consistent with previous research, participants' subjective fit perceptions were measured using a three item scale adapted from that used by Cable and Judge (1996). The scale comprises three questions: (1) "To what degree do you feel your values 'matched' or fitted the culture of Antarctic/sub-Antarctic stations?"; (2) "To what degree do you feel your values 'matched' or fitted those of other expeditioners?"; and (3) "Do you think the values and 'personality' of Antarctic/sub Antarctic stations reflect your values and personality?". Participants responded to each question using a 5-point Likert scale ranging from 1 "completely" to 5 "not at all".

Outcome variables

(a) Job satisfaction

Job satisfaction was measured using the 18 item O'Brien scale (O'Brien, Dowling and Kabanoff, 1978; O'Brien & Dowling 1980). The scale was selected because it was developed by researchers in an Australian context and has been applied to a wide range of organizations. Additional information on the properties and internal consistency of the O'Brien scale appears in Section 4.2.2 of Chapter 4.

(b) Intention to return

Participants' intention to return to Antarctica were measured with the question, "Would you be prepared to return again?" (1 = No, 2 = Yes). "Actual return" was determined by the extent to which participants returned to the Antarctic.

(c) Willingness to recommend Antarctica

Consistent with previous research (Cable and Judge, 1996) this study assessed expeditioners' willingness to recommend Antarctica to others as a good place to work with the question, "Would you recommend the Antarctic to your friends as a good place to work?" (No = 1, Y = 2).

(d) Role conflict, Role clarity and Accommodation

Role clarity, role conflict and accommodation were assessed using the three single item subscales of the OCI: (i) *Role clarity* - “Did you clearly know what was expected of you as a station member?”; (ii) *Role conflict* - “Did you receive inconsistent messages regarding what was expected?”; and (iii) *Accommodation* - “Did your job require you to think or behave differently than would otherwise be the case?” Participants were asked to respond to the subscales using a 5-point Likert scale ranging from 1 “Not at all” to 5 “To a very great extent”.

Control variables

Age, gender, educational qualifications, station position, type of expedition (“summerer or “winterer”)³⁰, and the year of the last expedition were used as control variables.

6.2.3 Procedure

Data were collected in two stages as described below.

Time 1. Each participant was sent the OCP and asked to sort the 54 values into 9 ordered categories using a scale ranging from 1 “least characteristic of Antarctic culture” to 9 “most characteristic of Antarctic station culture”, to indicate the extent to which, in their view, the values were characteristic of the culture of Australian Antarctic stations. Participants were also asked to complete the job satisfaction scale (O’Brien scale) and a demographic questionnaire containing questions on age, gender, educational background, number of expeditions, the year of their last expedition, the station location of their last expedition, their position, their intention to return to the Antarctic, and their willingness to recommend the Antarctic to others as a good place to work.

Time 2. Two months after completing the information provided at Time 1, participants were asked to complete the OCP again. On this occasion, however, participants were asked to sort the 54 values into nine ordered categories representing a scale ranging from

³⁰Expeditioners who were stationed in Antarctica for between 12 and 15 months, including an Antarctic winter, are referred to as “winterers”. Those stationed in Antarctica for up to 3 months during the summer only, are referred to as “summerers”.

1 “least desirable” to 9 “most desirable” to arrive at a description of their “ideal organization”. Participants were also asked to complete the OCI and the NEO PI-R.

6.3 Results

6.3.1 The Personality of the Australian Antarctic Expeditioner

The NEO PI-R five factor means scores of Australian Antarctic expeditioners were compared with the normative population³¹ using the appropriate gender norms as comparison vectors. The results of Univariate t-tests on the five factor mean scores are presented in Table 6.1.

Antarctic men differed significantly from their normative group on four of the five factors; they were lower on Neuroticism and Extraversion ($t=2.58$, $df=597$, $p<.05$ and $t=2.03$, $df=597$, $p<.05$), and higher on Openness and Agreeableness ($t=-3.36$, $df=597$, $p<.01$ and $t=-6.06$, $df=597$, $p<.01$). Results of the six NEO PI-R Facet scale scores revealed that in comparison to their normative group, Antarctic men were lower on the Neuroticism Facet scales *Angry Hostility* and *Impulsiveness* ($t=3.11$, $df=597$, $p<.05$ and $t=2.55$, $df=597$, $p<.05$) and lower on the Extraversion Facet scales *Gregariousness* and *Excitement Seeking* ($t=3.20$ $df=597$, $p<.05$ and $t=5.05$, $df=597$, $p<.05$). Antarctic men were higher than their normative group on the Openness Facet scales *Aesthetics*, *Actions* and *Values* ($t=-2.50$, $df=597$, $p<.05$, $t=-5.23$, $df=597$, $p<.05$, and $t=-3.41$, $df=597$, $p<.05$) and the Agreeableness Facet scales *Trust*, *Straightforwardness*, *Compliance*, *Modesty* and *Tendermindedness* ($t=-4.47$, $df=597$, $p<.05$, $t=-4.88$, $df=597$, $p<.05$, $t=-4.73$, $df=597$, $p<.05$, $t=-3.41$, $df=597$, $p<.05$ and $t=-3.88$, $df=597$, $p<.05$). Appendix F3 contains the six NEO PI-R Facet scale mean scores of men in each group.

Although overall, Antarctic women scored lower than their normative group on Neuroticism and higher on the remaining four factors, the majority of these differences were not statistically significant due to the small sample of women in this study. As Table 6.1 indicates, Antarctic women scored significantly higher than their normative group on Openness only ($t=-3.78$, $df=512$, $p<.01$). Results of the six NEO PI-R Facet

³¹The normative sample (500 men and 500 women) was drawn from a composite of three sub samples: (a) a group of 405 men and women in the Augmented Baltimore Longitudinal study of Aging (ABLSA); (b) 329 ABLSA participants who completed the NEO PI-R by computer administration between 1989 and 1991; and (c) 1,539 men and women who participated in a US study of job performance (Costa and McCrae, 1992).

scale scores revealed that in comparison to their normative group, Antarctic women were lower on the Neuroticism Facet scales *Anxiety*, *Depression* and *Vulnerability* ($t=2.04$, $df=512$, $p<.05$, $t=2.11$, $df=512$, $p<.05$ and $t=3.52$, $df=512$, $p<.05$), and higher on the Openness Facet scales *Fantasy*, *Actions*, *Ideas* and *Values* ($t=-2.97$, $df=512$, $p<.05$, $t=-3.61$, $df=512$, $p<.05$, $t=-2.20$, $df=512$, $p<.05$ and $t=-5.68$, $df=512$, $p<.05$). Interestingly, the results also revealed that Antarctic women were higher than their normative group on the Extraversion Facet scale *Positive Emotions* ($t=-3.44$, $df=512$, $p<.05$) and the Conscientiousness Facet scale *Competence* ($t=-2.32$, $df=512$, $p<.05$). Appendix F3 contains the six NEO PI-R Facet scale mean scores of women in each group.

Overall, Australian Antarctic men and women in this study scored lower on neuroticism than their normative groups. This result is consistent with past research (Steel et al., 1997) and Hypothesis 1, that Antarctic personnel score lower on Neuroticism compared to normative groups. Consistent with the findings of Steel and colleagues (1997) Antarctic men and women in this study also obtained higher scores on Openness and Agreeableness. However, in contrast to the findings reported by Steel and colleagues (1997) Australian Antarctic men were less extraverted than their normative counterparts, whilst the trend noted for Antarctic women was in the opposite direction. Overall, differences between Antarctic men and women on the NEO PI-R five factors were generally in the same direction as those of men and women in the normative groups³².

³² Refer to Costa and McCrae (1992) for further details on the differences between men and women in the normative group.

TABLE 6.1

Factor Means by Gender; Australian Antarctic sample and Normative sample ^a.

	Normative Mean (SD) (Men <i>n</i> = 500; Women <i>n</i> = 500)	Antarctic Expeditioners Mean (SD) (Men <i>n</i> = 99; Women <i>n</i> = 14)	<i>t</i> (Norm vs. Antarctic) (Men <i>df</i> = 597; Women <i>df</i> = 512)
Neuroticism			
Men	75.2 (19.9)	69.9 (18.4)	2.58*
Women	83.1 (21.7)	74.2 (19.6)	1.67
Extraversion			
Men	108.5 (18.5)	104.3 (18.8)	2.03*
Women	110.3 (18.4)	112.9 (19.9)	-0.48
Openness			
Men	110.1 (17.5)	117.0 (18.9)	-3.36**
Women	111.0 (17.2)	129.2 (17.8)	-3.78**
Agreeableness			
Men	120.1 (16.1)	129.5 (13.8)	-6.06**
Women	128.5 (14.4)	131.2 (15.7)	-0.63
Conscientiousness			
Men	123.6 (17.4)	123.7 (16.9)	-0.05
Women	122.7 (17.8)	126.7 (14.3)	-1.02

a. Costa and McCrae (1992).

p* < .05, *p* < .01 (two tailed).

6.3.2 Personality, Antarctic station culture and person-culture fit

The means, standard deviations and correlations between the five NEO PI-R Personality domains, person-organization fit (P-O fit), subjective fit, perceptions of Antarctic station culture, and control and outcome variables appear in Table 6.2.

A number of significant correlations was found between personality and control variables, including Openness and age ($r = -.22$, $p < .05$), gender ($r = .21$, $p < .05$), education ($r = .30$, $p < .01$), station position ($r = -.26$, $p < .01$) and wintering ($r = .20$, $p < .05$). The results suggest that younger women expeditioners with tertiary qualifications who wintered in Antarctica as medical practitioners and scientists were higher on Openness. The negative correlation between Neuroticism and number of expeditions ($r = -.18$, $p < .05$), suggests an association between low Neuroticism and return to Antarctica. In terms of perceived fit into

Antarctic station culture, a positive correlation was found between Openness and subjective fit ($r=.25$, $p<.01$), suggesting that the expeditioners who perceived themselves as fitting into Antarctic station culture were generally lower on Openness and more conventional in behaviour and conservative in outlook. This result is consistent with the finding that men, who comprised the majority of participants in this research, scored significantly lower on Openness than their normative group. It is also consistent with the perception of many women expeditioners, who were less likely to perceive themselves as fitting in to station culture, that Antarctic station culture is highly conventional, controlling and behaviour inhibiting (refer to Chapter 5).

As discussed previously, the high positive correlation between subjective fit and gender ($r=.46$, $p<.01$), and small and medium correlations between subjective fit and age ($r=-.34$, $p<.01$), and expedition era ($r=.24$, $p<.01$), suggest that older men who participated in all-male expeditions prior to 1980 reported better subjective fit with Antarctic station culture, compared to men and women who participated in mixed gender expeditions from the 1980s onwards. Correlations between control variables and P-O fit and control variables are discussed in Chapter 4.

A number of small and medium correlations were found between the five NEO PI-R domains and three OCI culture factors (Satisfaction, People-Security and Task-Security). In particular, the results revealed a correlation between Satisfaction and Agreeableness ($r=.20$, $p<.05$), and Satisfaction and Conscientiousness ($r=.25$, $p<.01$), which suggest that expeditioners who perceived Antarctic station culture as Satisfaction-oriented with Humanistic-Encouraging, Affiliate, Achievement and Self-Actualizing norms, were higher on Agreeableness and Conscientiousness. The three OCI factors are defined in Appendix F1 and the 12 OCI norms are defined in Appendix F2. Additional information on the OCI factors and subscales is presented in Section 5.2.2 of Chapter 5.

TABLE 6.2

Means, Standard deviations, and Correlations among Variables for Study V.

Variables	M	SD	1	2	3	4	5	6	7	8	9
Control Variables											
1. Age	54.71	12.91									
2. Gender (M=1, F=2)	1.12	.32	-.42**								
3. Education	3.73	1.73	-.13	.25**							
4. Position	4.63	1.80	-.00	-.17	-.29**						
5. Expeditions	2.18	1.50	.05	-.15	-.05	.02					
6. Winterer (W=1, S=2)	1.10	.30	-.22*	.31**	.31**	-.01	-.08				
7. Era (<1979=1, >1979=2)	1.50	.50	-.70**	.36**	.08	-.00	.20*	.27**			
Culture											
8. Satisfaction culture.	113.95	17.45	.17	-.22*	-.06	.09	.12	.16	-.18*		
9. People Security	77.44	15.76	-.13	.23*	.00	-.05	.08	-.01	.11	-.20*	
10. Task Security	62.19	13.80	.00	.13	-.04	-.06	-.02	-.08	-.05	-.04	.67**
Person-Organization fit											
11. Subjective fit	10.89	1.82	-.34**	.46**	.09	-.15	-.17	.01	.24**	-.42**	.25**
12. P-O fit (OCP)	1.52	.43	-.30**	.41**	.25**	-.11	-.17	.18*	.27**	-.38**	.46**
Personality											
13. Neuroticism	70.46	18.52	.06	.07	-.10	.03	-.18*	-.08	-.08	-.14	.11
14. Extraversion	105.38	19.13	-.18	.15	.00	-.11	-.03	.05	.12	.07	.06
15. Openness	118.56	19.17	-.22*	.21*	.30**	-.26**	.05	.20*	.16	.04	-.12
16. Agreeableness	129.78	14.06	-.03	.03	.00	.10	.18	.15	.09	.20*	.08
17. Conscientiousness	124.07	16.62	-.01	.06	.16	-.03	-.08	-.01	-.09	.25**	-.09
Outcomes											
18. Job satisfaction	74.88	7.91	.15	-.25**	-.08	-.00	.11	-.02	-.15	.29**	-.16
19. Intent to return (N=1, Y=2)	1.18	.38	-.24**	.10	-.11	-.01	.11	.16	.25**	.18*	.00
20. Intent to recommend (N=1, Y=2)	1.03	.18	.08	.07	.11	.04	-.01	.06	-.09	.04	-.07
21. Returned (N=1, Y=2)	1.57	.49	.00	-.10	.07	-.01	.68**	.00	.18	.06	.09
22. Role clarity	4.23	.85	.18	-.20*	.04	.05	.20*	-.16	-.14	.23*	-.15
23. Role conflict	1.87	.99	-.41**	.35**	.04	-.08	-.03	-.08	.42**	-.43**	.35**
24. Accommodation	2.51	1.20	-.15	.13	-.04	-.07	.11	-.06	.18	-.05	.24*

* $p < .05$, ** $p < .01$ (two tailed) Max $N=116$, Min $N=107$

TABLE 6.2 (Continued)
Means, Standard deviations, and Correlations among Variables.

Variables	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10. Task Security														
Person-Organization fit														
11. Subjective fit	.09													
12. P-O fit (OCP)	.34**	.52**												
Personality														
13. Neuroticism	-.00	.09	.03											
14. Extraversion	.14	.06	.08	-.33**										
15. Openness	-.04	.25**	.14	-.20*	.54**									
16. Agreeableness	-.02	.03	.06	-.28**	.07	.08								
17. Conscientiousness	-.01	-.10	-.08	-.43**	.25**	.15	.28**							
Outcomes														
18. Job satisfaction	.06	-.48**	-.33**	-.05	.20*	-.00	.13	.10						
19. Intent to return	-.03	.03	-.07	-.21*	.15	.14	.25**	.09	.13					
20. Intent to recommend	-.23*	.22*	-.10	-.03	.03	-.10	.23*	.03	.08	-.03				
21. Returned	.03	-.09	-.09	-.21*	-.02	.05	.20*	-.04	.10	.13	-.07			
22. Role clarity	-.05	-.36**	-.21*	-.08	.07	-.00	-.02	.15	.38**	.00	.22*	.13		
23. Role conflict	.30**	.40**	.45	.08	-.03	.08	-.04	-.27**	-.25**	.07	-.23*	.10	-.31**	-
24. Accommodation	.26**	.11	.22*	-.01	.14	.03	-.03	-.03	-.06	.08	-.20*	.00	.21*	.22*

* $p < .05$, ** $p < .01$ (two tailed) Max $N=116$, Min $N=107$

Intercorrelations between the three OCI factors and the six NEO PI-R Facet scales appear in Appendix F4. Results revealed significant positive correlations between perception of Antarctic station culture as Satisfaction-oriented and *Trust* ($r=.30, p<.01$), *Dutifulness* ($r=.25, p<.05$), *Competence* ($r=.23, p<.05$), *Achievement Striving* ($r=.19, p<.05$), and *Self-Discipline* ($r=.19, p<.05$), suggesting that expeditioners who were generally trusting of others and conscientious toward their work, tended to perceive Antarctic station culture as Satisfaction-oriented. The negative correlation between *Vulnerability* and Satisfaction ($r=-.21, p <.01$), and the positive correlation between *Vulnerability* and People-Security ($r=.23, p<.05$), suggest that individuals who were less able to cope with stressful situations and more prone to be panicked, tended to be less satisfied with their work and to perceive Antarctic station culture as a People-Security culture with Passive-Defensive norms. The negative correlation between Task-Security and *Values* ($r=-.22, p<.05$) suggests that expeditioners low on *Values* (i.e. dogmatic, conservative, honouring tradition and accepting authority), tended to perceive Antarctic station culture as a Task-Security culture with Aggressive-Defensive norms.

As indicated in Table 6.2, a number of correlations were found between P-O fit (OCP) and the three OCI factors, including a negative correlation between P-O fit and Satisfaction-oriented norms ($r=-.38, p<.01$), and a positive correlation between P-O fit and People-Security norms ($r=.46, p<.01$) and P-O fit and Task-Security norms ($r=.34, p<.01$). The results suggest that expeditioners who perceived the culture of Antarctic stations as Satisfaction-oriented achieved better P-O fit than those who perceived it as a Task-Security culture or a People-Security culture. Similarly a significant correlation was found between subjective fit and perception of Antarctic station culture as Satisfaction-oriented ($r=-.42, p<.01$), and between subjective fit and perception of Antarctic station culture as People-Security ($r=.25, p<.01$), suggesting that expeditioners who perceived themselves as fitting into Antarctic station culture, perceived the culture as Satisfaction oriented with Constructive norms, rather than a People-Security culture with Passive-Defensive norms.

A number of correlations were also found between the three OCI factors and outcome variables, including perception of Antarctic culture as a Satisfaction-oriented culture and

job satisfaction ($r=.29, p<.01$), role clarity ($r=.23, p<.05$), and role conflict ($r=-.43, p<.01$). These results suggest an association between the perception of Antarctic station culture as Satisfaction oriented and: (i) better job satisfaction; (ii) better role clarity; and (iii) less role conflict. Interestingly, the results also highlight that expeditioners who described the culture as Satisfaction-oriented, reported that they intended to return to Antarctic again in the future ($r=.18, p<.05$).

As Table 6.2 indicates, a number of small and medium correlations were found between personality and outcome variables, including Neuroticism and intent to return ($r=-.21, p<.05$) and Neuroticism and actual return ($r=-.21, p<.05$), indicating that expeditioners low on Neuroticism were more likely to return to Antarctica and to actually return. A correlation between Extraversion and job satisfaction ($r=.20, p<.05$) was also noted, suggesting that expeditioners high on Extraversion reported better job satisfaction. A number of correlations between Agreeableness and outcome variables were also found, including intent to return ($r=.25, p<.01$), willingness to recommend Antarctica to others ($r=.23, p<.05$), and actual return ($r=.20, p<.05$). The results suggest that individuals high on Agreeableness indicated that they: (i) intended to return to Antarctica; (ii) would recommend it to others as a good place to work; and (iii) were more likely to actually return. The significant negative correlation found between Conscientiousness and role conflict ($r=.27, p<.01$), suggests that expeditioners high on Conscientiousness reported less role conflict. However, in view of the multiple tests of significance conducted, small and medium correlations need to be interpreted with caution.

As Table 6.2 indicates, correlations were also found between control and outcome variables, including age and role conflict ($r=-.41, p<.01$), era and role conflict ($r=.42, p<.01$), gender and role conflict ($r=.35, p<.01$), gender and role clarity ($r=-.20, p<.05$) and expeditions and role clarity ($r=.20, p<.05$). These results suggest that: (i) women generally reported more role conflict and less role clarity than men; (ii) older men who participated in expeditions prior to 1980 generally reported less role conflict and better role clarity than women or younger men who participated in expeditions from 1980 onwards; and (iii) expeditioners who returned to the Antarctic reported less role conflict than those who did not. Correlations between control and other outcome variables are presented in Chapter 4.

6.3.3 Links between Personality and perceptions of Antarctic culture

In order to assess the possibility of more complex relationships between personality and perceptions of Antarctic station culture, further analyses were undertaken. Although the correlations discussed above suggest a number of predictor variables, their relative importance is unclear. Ordinary-least-squares multiple regression analyses were used to examine the extent to which the five personality traits predicted perceptions of Antarctic station culture and the results appear in Table 6.3. The average variance explained in perceptions of the 12 OCI styles was 10%. The coefficients reported in Table 6.3 are standardized regression coefficients for the five “Big Five” domains and controlling for age, gender, wintering, expeditions and expedition era.

Results in Table 6.3 provide some support for Hypothesis 2, that perceptions of Antarctic station culture are affected by expeditioners’ personality traits. In particular, Conscientiousness, Agreeableness and Openness were significant predictors of participants’ perceptions of Antarctic station behavioural norms and expectations. Expeditioners high on Conscientiousness generally perceived Antarctic station culture as Satisfaction-oriented with Humanistic-Encouraging, Affiliative and Achievement norms, whilst those low on Conscientiousness perceived it as a Task-Security culture with Avoidance and Competitive norms. Similarly, expeditioners high on Agreeableness perceived Antarctic station culture as Affiliative, whilst those low on Openness perceived it as more Dependent and Competitive.

TABLE 6.3

Standardized regression coefficients for five personality traits as predictors, and twelve perceptions of Antarctic station culture variables as separate criteria.

	Humanistic Encouraging	Affiliative	Approval	Conventional	Dependent	Avoidance	Oppositional	Power	Competitive	Perfectionistic	Achievement	Self- Actualizing
Neuroticism	-.09	-.12	.05	.04	.13	.15	-.09	-.04	.06	-.04	-.07	-.02
Extraversion	.13	.17	.02	.07	.00	-.02	.05	.11	.13	.15	.14	-.00
Openness	.08	.07	-.13	-.18	-.20*	-.10	-.01	.00	-.20*	.03	.13	-.06
Agreeableness	.09	.24**	.15	.08	.12	-.12	-.04	.00	-.13	.13	.09	.11
Conscientiousness	.35**	.23*	-.06	-.06	-.00	-.19*	-.02	-.01	-.21*	.11	.18*	.16

* $p < .05$, ** $p < .01$ (two tailed). Estimates are standardized regression coefficients adjusted for age, gender, number of expeditions, wintering, and expedition era (before 1980 and 1980 onwards). *Max N=116, Min N=107*

6.3.4 Links between Personality and Subjective Fit perceptions

Hierarchical regression analysis was used to determine the relationship between personality and subjective fit and the results of the regression analysis appear in Table 6.4. In predicting fit, the control variables (age, gender, expeditions, wintering, and expedition era) were entered on the first step of the regression equation. The five NEO personality domains were entered on the second step.

TABLE 6.4
Hierarchical Regression Estimates Predicting Subjective Fit Perceptions.

Model	Variable	Final B	Final β
1.	Age	-.02	-.16
	Gender (M=1, F=2)	2.18	.39
	Expeditions	-.19	-.21
	Winterer (W=1, S=2)	-1.05	-.24
	Era (<1979=1, >1979=2)	.24	.04
$R^2 = .28^{**}$, $F_{ch.} = 8.41$, $df = 5, 104$			
2.	Neuroticism	-.00	-.02
	Extraversion	-.01	-.12
	Openness	.02	.27
	Agreeableness	.01	.11
	Conscientiousness	-.02	-.20
$R^2 = .37^{**}$, $F_{ch.} = 5.88$, $df = 10, 99$			
$R^2 \text{ ch.} = .09$			

* $p < .01$ ** $p < .001$ (two tailed), $N=105$

Overall, the results revealed a significant relationship between personality traits and subjective fit perceptions. Specifically, expeditioners high on Openness and Conscientiousness reported better fit with Antarctic station culture, supporting Hypothesis 3, that personality traits impact on perceived fit with Antarctic station culture. As Table 6.4 indicates, the results showed that the change in R^2 resulting after the exclusion of the control variables was significant ($F_{ch.} = .09$, $df = 10, 94$, $p < .01$). This suggests that despite the effect of the control variables on subjective fit perceptions, the unique effect of personality traits accounted for significant independent variance.

6.3.5 Links between Personality and Outcomes

Ordinary-least-squares multiple regression analyses were used to examine the extent to which personality traits predicted individual job outcomes, including job satisfaction, intention to return, willingness to recommend, actual return, role clarity, role conflict, and accommodation. The average variance explained by personality was 16% and the results appear in Table 6.5. The coefficients reported in the Table are standardized regression coefficients for the “Big Five” traits and controlling for the variables age, gender, wintering, expeditions and expedition era.

Results in Table 6.5 indicate a relationship between Extraversion and job satisfaction; expeditioners high on Extraversion reported significantly better job satisfaction. A relationship between Conscientiousness and role conflict was also identified; expeditioners high on Conscientiousness reported less role conflict. In addition, a significant relationship between Agreeableness and intention to return was revealed; expeditioners high on Agreeableness generally reported that they intended to return to the Antarctic in the future. These findings provide some support for the hypothesised relationship between personality and job outcomes. In particular, significant predictive relationships were revealed between personality and role conflict, job satisfaction and intent to return to the Antarctic.

TABLE 6.5

Standardized regression coefficients for five personality traits as predictors, and seven outcome variables as separate criteria.

	Job satisfaction	Intention to return	Willingness to Recommend	Actual Return	Role clarity	Role conflict	Accommodation
Neuroticism	-.01	-.17	-.07	-.08	-.06	.05	-.00
Extraversion	.25**	.11	.10	.00	.12	-.14	.10
Openness	.04	.08	.01	.01	.04	.00	-.00
Agreeableness	.12	.21*	.09	.07	-.04	-.02	-.04
Conscientiousness	.12	.12	.09	.01	.18	-.25**	-.01

* $p < .05$, ** $p < .01$ (two tailed). Estimates are standardized regression coefficients adjusted for age, gender, number of expeditions, wintering, and expedition era (before 1980 and 1980 onwards). *Max N=116, Min N=107*

6.4 General Discussion

The results of this study support the findings of Steel and colleagues (1997) that Antarctic expeditioners score lower on Neuroticism compared to normative groups. The findings also suggest that ANARE expeditioner selection procedures and/or the nature of Antarctic work result in the selection of “emotionally stable” individuals (Costa and McCrae, 1992, p. 15).

However, contrary to the findings of Steel and colleagues (1997), the results suggest that Australian Antarctic men are more introverted than their normative group, with lower scores on the *Gregariousness* and *Excitement Seeking* Facets of Extraversion compared to their normative counterparts. Furthermore, although the results for women are limited due to the relatively small sample of women in this study, results suggest that Australian Antarctic women are generally more open, and may be more extraverted than their normative group, with Antarctic women scoring higher on the *Positive Emotions* Facet of Extraversion than their normative counterparts. Further research is required to determine the extent to men selected for ANARE expeditions are similar to men on other international Antarctic stations or other isolated and confined environments.

The present study provided support for a link between personality traits and perceptions of Antarctic station culture using two different, previously validated scales that measure two different aspects of individuals (personality using the NEO PI-R, and perceptions of Antarctic station culture using the OCI). Although it may be argued that the personality effects are relatively small, with the average absolute effect size between the “Big Five” personality traits and the 12 OCI culture styles being $r=.18$ (see Table 6.3), results of linkages between Conscientiousness and Satisfaction-oriented norms (Humanistic-Encouraging, Affiliate, Self-Actualising and Achievement) reveal an average Beta coefficient of $\beta=.23$, which is not trivial. Results suggest that expeditioners high on Conscientiousness tended to perceive Antarctic station culture as Satisfaction-oriented, rather than Security-oriented. Prior research on the OCI has suggested that “ideal” organizations take the form of Satisfaction-oriented cultures with behavioural norms and expectations that correlate positively with positive job outcomes, whilst Security-oriented cultures are characterized by behaviour inhibiting norms (e.g., risk avoiding) that correlate

positively with negative job outcomes (Cooke and Rousseau, 1988; Rousseau, 1990a, 1990b; Cooke and Szumal, 1993; van der Velde and Class, 1995).

The hypothesized link between personality and subjective fit was supported. In particular, the results highlighted that in addition to demographic characteristics, and P-O fit (OCP), personality was a significant predictor of expeditioners' subjective fit judgements. Although past research has investigated the relationship between P-O fit and subjective judgements within the context of job seekers' preferences of recruiting business organizations (Cable and Judge, 1996), this is the first study investigating person-organization fit in an isolated and confined setting. It is also the first study of its kind within the context of Antarctic station culture.

Finally, the results of this study provided support for the hypothesized relationship between personality and Antarctic station job outcomes. In particular, results demonstrated that on Australian Antarctic stations: Extraversion positively and significantly predicted higher job satisfaction; Agreeableness predicted intent to return; and high Conscientiousness predicted low role conflict. Although past research in business settings has examined the relationship between perceived fit and job outcomes (Chatman, 1989; O'Reilly et al., 1991), the relationship between personality and individual job outcomes has not been fully explored. Furthermore, within the context of Antarctic station culture, the relationship between personality traits and job outcomes was previously unexplored.

6.4.1 Implications

By investigating the relationship between the "Big Five" personality traits, including the six facets that represent each trait and perceptions of Antarctic station behavioural norms, this research study has extended past research on the personality of Antarctic expeditioners (eg., Steel et al., 1997), and past research on organizational culture and person-organization fit (Cable and Judge 1996; Chatman, 1989, 1991; Cooke and Rousseau, 1988; Judge and Cable, 1997; O'Reilly et al., 1991; Rousseau, 1990a, 1990b; Schein, 1990). In particular, by investigating the relationship between personality and perceptions of organizational culture using both a nomothetic (OCI) and an idiographic (OCP) measure, this study has extended past quantitative research (eg., Judge and Cable,

1996, 1997) which has explored this relationship using a single idiographic measure of organizational culture (OCP) and a nomothetic scale of personality (refer to Cable and Judge, 1996, 1997). Furthermore, by identifying the relationships between personality, perceptions of Antarctic station behavioural norms, person-culture fit, and individual job outcomes, this study has provided the Australian Antarctic Division (AAD) with important information on the culture of Antarctic stations which may be utilised by the AAD or other Antarctic employers to: (i) address the recurring social problems on stations (refer to Chapters 2, 3 and 4); (ii) enhance current expeditioner selection and screening, and (iii) facilitate a process of cultural change through intervention to improve the functioning of Australian Antarctic stations as social systems.

In summary, this study identified a link between: (i) personality traits and perceptions of Antarctic station norms and expectations; (ii) personality and subjective fit perceptions; and (iii) personality and job outcomes, including job satisfaction, intent to return and low role conflict. In addition, this study identified interesting and distinct trends in the personality traits of Australian Antarctic men and women, which may be further explored.

6.4.2 Limitations & Future research

This study has several limitations that should be acknowledged. First, as previously highlighted, organizational culture was assessed here on the basis of individuals' perceptions of Antarctic station values and norms, rather than independent observation. Second, this is a study of Australian Antarctic expeditions and the nature of the sample limits generalizability of results to other international Antarctic stations which differ in occupational composition. Future research needs to extend the findings of this study by identifying the extent to which Australian Antarctic station culture and the links identified between perceptions of Antarctic station culture, personality, person-culture fit and job outcomes, also apply to other international polar stations, and isolated and confined teams in other extreme environmental settings, including undersea and outer space facilities.

CHAPTER 7

Summary

This thesis investigated the culture of isolated Australian Antarctic stations using a combination of qualitative and quantitative methods of assessment. The use of a combined methodological approach permitted the identification of specific elements of Antarctic station culture, including symbols, heroes, rituals, stories, values, behavioural norms and underlying assumptions. This research also investigated the extent to which congruence between perceived Antarctic station values and preferred individual values can be used to determine the degree of person-culture fit within Australian Antarctic station life and culture. Overall, five studies were undertaken providing an overview of Antarctic station culture since the establishment of ANARE (1950-1999) and a framework for ongoing monitoring of Antarctic stations in the future.

This chapter summarises the results and implications of this research.

7.1 Study I

The first study explored the culture of Australian Antarctic stations using a two-part semi-structured interview. It explored the experiences of men and women towards Antarctic station life and identified the most salient aspects of Antarctic station culture. Individual elements of culture were investigated, including visible artefacts (eg., symbols, heroes, rituals, stories) and values, and the characteristics required for good “fit” into Antarctic station life were identified. The participants were 31 returned Australian Antarctic expeditioners who lived and worked on an Australian Antarctic station between 1950 and 1999. It was a mixed age group comprising 26 men and five women. The group included station leaders, medical practitioners, chefs, researchers, meteorological technicians, communications personnel and trade workers, including carpenters, electricians, plumbers and diesel mechanics.

The results of this study highlighted a number of important themes that were further explored in subsequent qualitative and quantitative studies, including the existence of two distinct eras of Australian Antarctic culture: the all-male era of ANARE up to 1980, and the two decades of mixed expeditions from 1980 onwards. Consistent with past theoretical research on organizational culture, the findings reflect the extent to which culture perpetuates and reproduces itself over time, and the extent to which internal and external changes force new learning and adaptation (Schein, 1984, 1990; Chatman, 1991).

Four major sources of change to Australian Antarctic station culture were identified: (i) technological changes and advances in communication; (ii) the station re-building program; (iii) the influx of construction workers during the station rebuilding program; and (iv) the introduction of women expeditioners. These events had a major impact on all aspects of Antarctic station life and are likely to account for the existence of the two distinct eras of Antarctic station culture since the 1950s.

Consistent with past theoretical research on organizational culture (eg., Schein, 1984) specific elements of Antarctic station culture were identified, including symbols, heroes, rituals, stories and values. In particular, a variety of symbols of Antarctic station culture were highlighted, including language (eg., uniquely Antarctic acronyms phrases and jargon), hairstyles, beards, clothing and artefacts. It was of interest to note that many examples of Antarctic station symbols, heroes, rituals and stories dating back to the earliest Antarctic expeditions in the 1950s were identified, reflecting the residual influence of the early era of ANARE history on station life today. This is consistent with past theoretical research that has shown that organizational or group culture is learned and taught to members and that it perpetuates and reproduces itself over time with the socialization of new members (Schein, 1990; Chatman, 1991).

The results of interviews with returned expeditioners revealed that good station “fit” required certain individual attributes and social skills. In particular, participants indicated that expeditioners needed to be “team-oriented”, “even tempered” “flexible”, “sociable” and “tolerant” of others and able to avoid conflict in order to “fit in”. An individual’s failure to “fit in” to station life was attributed by participants to a lack of social skills, and considered by them to be symptomatic of the ascendancy of occupational competence over social competence in expeditioner selection and screening. For instance, whilst job competence, interpersonal skills and physical and mental health were identified as key values espoused by the Australian Antarctic Division (AAD), participants referred to discrepancies between these espoused values, and the values actually sought in new recruits. In addition, participants highlighted that although it was assumed that antisocial behaviour was “screened out”, antisocial behaviour (eg., drunkenness) was evident on stations and threatened the harmony and social functioning of stations.

The results of Study I reveal that for most returned expeditioners, the Antarctic environment was the most salient aspect of their experience in Antarctica followed by a number of social issues, including: the impact of interpersonal conflict on stations, particularly gender discrimination; the residual influence of the early male era of Antarctic history on station culture; and the need for improvements in expeditioner screening to ensure that antisocial behaviours, particularly alcoholism, are screened out and a better balance of job and social competence is achieved.

7.2 Study II

The results of Study I provided support for a second qualitative investigation to further explore recurring gender based conflict on stations, and the extent of “fit” of women into Antarctic station life and culture. The investigation explored the attitudes and experiences of women toward Antarctic station life and culture. The participants were 14 women expeditioners who participated in ANARE expeditions to the Antarctic and sub-Antarctic between 1985 and 1999. The group included station leaders, medical practitioners, chefs, scientists, meteorological technicians and communications personnel. There were no trade workers in the group since trades personnel (eg., carpenters, electricians, plumbers, diesel mechanics and builders) are almost always men.

References to a male dominated “building site” image of station life was a striking feature of women’s comments throughout this investigation. Women suggested that in order to “fit in” to station culture, expeditioners needed to be men, ideally tradesmen, who enjoyed drinking and tolerated drunkenness and inappropriate social behaviour from others. In particular, women’s comments highlighted the existence of a male dominated “pub culture” on Antarctic stations in which trade workers, which women referred to as the most dominant occupational group, defined behavioural norms and values whilst women, and to some extent scientists, remained the “outsiders” because they were less likely to “fit into” the dominant male workers culture that prevailed on stations³³ (Becker, 1973). The findings also revealed that following the commencement of the station re-building program in the 1980s, social problems on stations were exacerbated as the focus of expeditions shifted from Antarctic research to building construction and maintenance.

³³According to the sociological view advanced by Becker (1973), the term outsiders refers to individuals judged to stand outside the circle of the dominant group.

This shift in focus, impacted on the composition of stations and all aspects of Antarctic station life and culture from the early 1980s, through to the late 1990s when the station re-building program was completed.

The results of Study II highlighted a possible link between professional animosity and gender based problems on stations from the 1980s onwards. In particular, whilst professional rifts between scientists and trade workers were reported in expeditions during the 1950s, 1960s and 1970s, following the introduction of mixed gender expeditions in the early 1980s professional animosity was compounded by gender based conflict between women, who were usually recruited as scientists, and trade workers who were almost always men. The results also suggest that social problems on stations may reflect the competing interests of (i) Antarctic science versus building maintenance, and (ii) cultural change versus cultural preservation of the early all-male era of ANARE.

The findings of Studies I and II also highlight the extent to which cultural change may be required through intervention to improve the social functioning of Australian Antarctic stations as multi-disciplinary research teams. Consistent with past theoretical research (eg., Argyris and Schon, 1978; Argyris, Putnam and Smith, 1985; Walton, 1987; Hanna, 1988; Schein, 1984, 1990; Tushman and O'Reilly, 1997), a process of guided and managed change may be necessary to enhance cultural elements viewed as desirable and promote "unlearning" of elements considered detrimental to group functioning. In particular, managed change through intervention may be necessary to guide the further development of Antarctic station culture and facilitate immediate improvements in: (i) the functioning of mixed expeditions as multi-disciplinary research teams; (ii) the representation of women on stations, particularly during winter expeditions; and (iii) the operational administration of ANARE, to ensure that Antarctic stations are managed in accordance with Australian Government regulations on Equal Employment Opportunity (EEO) and workplace harassment and discrimination.

7.3 Study III

On the basis of the information gathered in Studies I and II, it was possible to formulate hypotheses about underlying basic assumptions of Antarctic station culture, consistent with the theoretical models of organizational culture formulated by Schein (1984) and

Rousseau (1990a, 1990b), and the model of person-culture fit formulated by Chatman (1989), and to investigate these hypotheses using quantitative research methods.

Study III was undertaken to investigate the quantitative assessment of Antarctic station values and the notion of person-culture fit within the context of Australian Antarctic station life. The study was also undertaken to determine the extent to which congruence between Antarctic station values and individual values affects individual attitudes and job outcomes, including job satisfaction, subjective fit perceptions, and perceptions of group cohesion. Person-culture fit was assessed in terms of the congruence between perceived Antarctic station values and individual values, using the Organisational Culture Profile (OCP; O'Reilly, Chatman and Caldwell, 1991), which is an idiographic measure of organizational culture based on Q-sort methodology. The study was undertaken on a group of 117 men and women who participated in Australian Antarctic expeditions between 1950 and 1999. The group included station leaders, medical practitioners, chefs, scientists, meteorological technicians and trades and communications personnel.

The results of Study III support the proposition that subjective fit perceptions emanate from the congruence between perceived organizational values and preferred individual values (Cable and Judge, 1996). Consistent with the findings of Studies I and II, the results of this study also suggest that within the context of Antarctic station life, perceived fit is also affected by demographic variables such as gender, with men reporting better fit with Antarctic station culture than women.

In terms of values, results highlighted differences in the values that men and women identified as "most characteristic" and "least characteristic of Antarctic station culture", and differences in their organizational preferences. For instance, in contrast to men, women expeditioners regarded "Being distinctive" as least characteristic and "Fitting in" as most characteristic of Antarctic station culture. The findings highlight the minority group status of women on stations, and the perception of many that being distinctive or different to the group is disadvantageous for "fitting in" to the dominant male culture. These findings are also consistent with the results of the previous two qualitative studies that highlighted the existence of a male dominated culture on stations, and the prevalence of gender based problems since the introduction of women to ANARE. Further, the

strong relationship identified between gender, age and perceived fit supports the notion that two distinct eras of Antarctic station culture existed since the 1950s: the all-male era of ANARE when the culture of Antarctic stations was created and when demographic similarity between recruits was at its optimum, and the two decades of mixed ANARE expeditions from the 1980s onwards in which women have been under-represented, particularly in winter expeditions. The results of Study III also revealed differences in the organisational preferences of tradesmen and male scientists that may account for reported conflict between the two occupational groups since the earliest all-male ANARE expeditions.

Consistent with past research on person-organization fit (e.g., Chatman, 1989, 1991; O'Reilly et al. 1991; Cable and Judge, 1996), participants' perceived fit positively and significantly predicted their job satisfaction. The results also revealed a significant positive association between perceived group cohesion and job satisfaction, supporting the proposition of past research that individuals are unlikely to feel attracted to a group unless they experience some personal satisfaction from their membership of it (Dailey, 1978; Summers et al., 1988). However, given the recurring social problems and the under-representation of women on stations, one needs to question the extent to which "good fit" with the current Antarctic station value system is desirable. In particular, it may be argued that an equal representation of men and women on ANARE selection panels, and a better "mix" of recruits in terms of gender and age for all Antarctic expeditions is preferable in order to: (i) overcome recurring gender-based conflict considered to threaten the functioning of Antarctic stations as harmonious research communities; and (ii) improve the degree of fit of women expeditioners to Antarctic station culture by progressively managing the dominant culture through the recruitment of an equal proportion of men and women and the introduction of new rules and procedures concerning sexual harassment and discrimination.

7.4 Study IV

Study IV was undertaken to explore the quantitative assessment of organizational culture using a normative measure of culture and to determine the extent to which specific dimensions of Australian Antarctic station culture could be identified. The study was also undertaken to identify the behavioural norms and expectations considered characteristic

of Antarctic station culture and to investigate their impact on job outcomes, including job fit, role clarity, role conflict and job satisfaction. Behaviour norms and expectations were assessed using the Organizational Culture Inventory (OCI; Cooke and Lafferty, 1989), which is a normative measure of organizational culture. The study was undertaken on a group of 116 returned expeditioners drawn from the sample used in the previous study.

The results of Study IV showed significant gender effects on perceptions of Antarctic station culture within the context of the two underlying dimensions: a concern for task versus people; and a need for security versus satisfaction. In particular, whilst men referred to Antarctic station culture as a strong People-Satisfaction oriented culture characterized by norms and expectations for Humanistic-Encouraging, Affiliative, Achievement and Self-Actualizing norms and expectations, women described it as a highly conventional and rule oriented People-Security culture, with controlling rather than supportive interpersonal behavioural norms. Past research has shown that Satisfaction-oriented norms are characteristic of “ideal” cultures, whilst Security-oriented cultures are characteristic of organizations such as U.S. Naval air squadrons and aircraft carrier deck operations with controlling behavioural norms (Rousseau and Cooke, 1988; Rousseau, 1989).

Consonant with past research (eg., Rousseau, 1990a, 1990b), expeditioners’ perceptions of Antarctic station culture significantly predicted their role clarity, job fit, job satisfaction, willingness to return, and their intention to recommend Antarctica to others. In particular, Satisfaction norms correlated positively with role clarity, job fit, job satisfaction, willingness to return and intention to recommend Antarctic to others, and negatively with role conflict, whilst Security norms correlated positively with role conflict and accommodation, and negatively with role clarity, job fit and job satisfaction.

Finally, the results of Study IV revealed the existence of Antarctic station subcultures, with different behavioural norms and expectations reported by men and women and different occupational groups. In particular, striking gender differences in perceived Antarctic station values, (identified in Study III) and perceived norms and expectations (identified in Study IV) provide evidence for the existence of station subcultures, with women expeditioners, and cooks/chefs reporting different behavioural norms and

expectations to the dominant male group on stations. Differences were also identified between perceived behaviour norms and expectations reported by summerers and winterers. However, given that summerers remain on Antarctic stations for up to three months over the summer months only, identified differences between the two groups may reflect differences between summer and wintering expeditions, rather than the existence of subcultures that co-exist on stations.

Results also revealed changes to perceived norms and expectations over time, with pre-1980 expeditions described as more open and friendly than the mixed and less homogeneous expeditions of the 1980s and 1990s. Although past research has identified the existence of organizational subcultures (eg., Rousseau, 1989; Cooke and Rousseau, 1990), changes in perceived behavioural norms and expectations within a single organization over time, have not been fully explored. Furthermore, the behavioural norms and expectations of isolated and confined Antarctic stations have not been previously investigated.

7.5 Study V

Study V compared the general personality characteristics of Australian Antarctic expeditioners to a normative population using the five factor NEO PI-R (Costa and McCrae, 1992). The study also investigated: (i) the extent to which perceptions of Antarctic station behavioural norms and expectations are consonant with certain personality traits; (ii) the relationship between personality and perceived fit into Australian Antarctic station culture; and (iii) the relationship between personality and individual job outcomes on Australian Antarctic stations.

The results of Study V support the findings of Steel and colleagues (1997) indicating that Antarctic expeditioners score lower on Neuroticism compared to the normative groups of the NEO PI-R. However, contrary to the findings of Steel and colleagues, the results suggest that Australian Antarctic men are more introverted than their normative group, with lower scores on the *Gregariousness* and *Excitement Seeking* Facets of Extraversion compared to their normative counterparts. Furthermore, although the results for women are limited due to the relatively small sample of women in this study, results suggest that Australian Antarctic women are generally more open, and may be more extraverted than

their normative group, with Antarctic women scoring higher on the *Positive Emotions* Facet of Extraversion than their normative counterparts. Further research is required to determine the extent to which men and women selected for ANARE expeditions are similar to men and women on other international Antarctic stations and other isolated and confined environments.

The results of Study V provided support for a link between personality traits and perceptions of Antarctic station norms and expectations, with expeditioners high on Conscientiousness perceiving Antarctic station culture as more Satisfaction-oriented. Results also demonstrated a significant relationship between personality traits and subjective fit perceptions. Although past research has investigated the relationship between P-O fit and subjective fit judgements in terms of job seekers' preferences for recruiting organizations (Cable and Judge, 1996), this is the first study investigating person-organization fit in a non-business setting, and the first study of its kind within the context of isolated Antarctic stations.

Finally, Study V provided some support for a link between personality and Antarctic station job outcomes. Specifically, results demonstrated that on Australian Antarctic stations: (i) Extraversion positively and significantly predicted higher job satisfaction; (ii) Agreeableness predicted intent to return; and (iii) high Conscientiousness predicted low role conflict. Although past research has explored the relationship between perceived fit and job outcomes (Chatman, 1989; O'Reilly et al., 1991), the relationship between personality and individual job outcomes has not been fully explored.

7.6 Research Implications

This thesis highlights the benefits of a research approach combining quantitative and qualitative methods to investigate organizational culture. In particular, this thesis identified a multi-method approach that may be used to investigate the surface levels of organizational culture (eg., organizational artefacts, symbols, heroes, rituals and stories), on the basis of interviews with expeditioners, as well as the deeper, less accessible levels, comprising values (assessed using the OCP), behavioural norms (assessed using the OCI) and underlying beliefs and assumptions (identified on the basis of interviews with expeditioners and further investigated using the OCP and OCI).

There are clear advantages to using an approach that combines quantitative and qualitative methods, since, as Cooke and Rousseau (1988) point out, in many ways the two research methods are complementary. Whilst not all elements of culture are amenable to quantitative assessment, the quantitative techniques used in this research in particular, may be advantageous for: (i) cultural comparisons across organizations and subcultures over time; (ii) assessing organizational values and patterns of behaviour; (iii) assessing person-culture fit; and (iv) exploring the relationship between organizational culture and job outcomes. Although qualitative research techniques tend not to facilitate systematic comparisons across organizations and subcultures over time, interviews with “motivated insiders” such as those undertaken in Studies I and II of this thesis, allow the researcher to gain access to rich data that are essential for understanding the underlying assumptions of a group and allow members of a group or organization to articulate how they perceive “the world around them” (Schein, 1990: p. 112).

This research also highlights the extent to which organizational culture can be investigated without access to an organizational research site. For instance, within the context of this investigation, access to Antarctic stations was requested on three separate occasions and rejected each time. Obstacles to gaining access to Antarctic stations for research purposes included: (i) the low priority status of independent psychological research within the context of the Australian Antarctic Research Agenda; and (ii) the fact that this research investigation was independent of the AAD with possible implications for the AAD’s ANARE expeditioner selection and screening program.

Despite the lack of access to Antarctic stations, however, an investigation of Australian Antarctic station culture was undertaken because it was possible to gain access to Australian Antarctic expeditioners on their return to Australia. Australian Antarctic personnel are recruited to Antarctic expeditions annually and return to Australia upon completion of their Antarctic tour of duty. By focusing on the large and accessible population of returned expeditioners living in Australia, an investigation of Antarctic station culture was therefore possible despite the lack of support from the AAD.

There are clear advantages to accessing information on an organization from the outside. In particular, unlike participant observer based research in which investigators gain access to organizations to gather information but inevitably disturb the research site in the process, the method used here enabled an investigation of Antarctic station culture with minimal impact to the research site.

The limitations of participant observer based research have been addressed in the literature. For instance, according to Schein (1993), organizational research that is solely “ethnographic” or “participant observer based” operates from the traditional scientific model in which the investigator requests entry into an organization or alternatively infiltrates the research site to make observations without disturbing the situation. Schein (1993) argues that by its very nature such research tends to produce superficial data unless one uses unobtrusive methods or manipulates the situation experimentally, both of which are hard to do and unethical in most organizational settings. Schein suggests that “in some models of research, the less one influences the research site, the better a researcher he or she is” (Schein, 1993: p. 703). However, from the methodological limitations inherent in traditional participant observation, in some research situations, particularly investigations involving groups in isolated and extreme environmental settings, direct access to the research site by the interviewer may not be possible. In such situations alternative approaches to gathering qualitative research need to be considered. The method used in this research not only offers an effective alternative to participant based observation, but may also be more appropriate.

By focusing on returned Australian Antarctic expeditioners, it was possible to investigate Australian Antarctic station culture over time. In particular, the results of this investigation provide an overview of the development of Australian Antarctic station culture since the establishment of ANARE (1950-99), and a framework for the ongoing monitoring of station culture in the future. This thesis also identified a research framework that may be applied to other organizational settings, including business settings. Although with studies of this kind there is a need to consider the possibility of participants forgetting aspects of their experience or perceiving their experience more positively and negatively over time, the results of this investigation did not suggest that perceptions of Antarctic station culture changed with the passage of time.

By identifying and measuring the culture of isolated and confined Antarctic stations, this research has extended existing polar research and added generalizability to past research on organizational culture. Further, by investigating the extent to which congruence between individual and perceived organizational values affects individual attitudes and job outcomes within groups in isolated and confined settings, this research has added generalizability to past research on person-organization fit (eg., O'Reilly et al., 1991; Cable and Judge 1996). This research also highlighted that the OCP and OCI are two useful tools that measure distinct elements of organizational culture that may be applied to non-business organizational settings, including isolated groups in extreme environmental settings.

By investigating the relationship between the “Big Five” personality traits, perceptions of Antarctic station behavioural norms, perceived fit and individual job outcomes, this research has extended past studies on organizational culture and the assessment of person-culture fit in business settings (Cable and Judge 1996; Chatman, 1989, 1991; Cooke and Rousseau, 1988; Judge and Cable, 1997; O'Reilly et al., 1991; Rousseau, 1990a, 1990b; Schein, 1990). In addition, whilst past Antarctic research has identified the personality characteristics of expeditioners (eg., Steel et al., 1997), the relationship between personality and perceived fit into Antarctic station culture and perceived fit and job attitudes remain unexplored. Further, in contrast to past research in business settings (eg., Cable and Judge, 1996), the findings of this research revealed that within some organizational settings, demographic characteristics such as age and gender predict: perceptions of group culture; the extent of person-culture fit; and individual job attitudes and outcomes.

7.7 Implications for ANARE

In summary, this thesis generated a culture profile representing Australian Antarctic station values over the last 50 years of ANARE. It identified the dimensions of Antarctic station culture in terms of behavioural norms and expectations, and the characteristics associated with ‘good fit’ into Antarctic station culture. The research also determined the impact of perceived culture on job outcomes, including job fit, role clarity, role conflict and job satisfaction.

This information may be useful for ongoing monitoring of Antarctic stations and for implementing cultural change. Specifically, the information may be used to: (i) change the selection criteria and socialization practices of Australian Antarctic recruits; (ii) guide the evolution of Antarctic station culture by enhancing cultural elements considered critical to ANARE goals and practices, and “unlearning” cultural elements that may be viewed as dysfunctional; and (iii) instigate managed cultural change if elements of the culture are perceived to be dysfunctional for the organization’s survival and growth in a changing environment. In particular, a process of managed cultural change may be necessary to address identified social problems on stations and to facilitate a process of cultural change designed to enhance the functioning of Australian Antarctic stations as social systems.

Managed change may be used to move Antarctic station culture from its current state to a desired state through a period of transition instigated by the leaders and management of Australian National Antarctic Research Expeditions. This process may involve any one of a number of strategies, including: (i) management articulating a new direction and a new set of assumptions, in order to gather support for change; (ii) the creation of new symbols, rituals, values and norms based on the new direction and assumptions; (iii) key positions on stations being filled with new recruits who hold values consistent with the desired direction of change; and (iv) the creation of heroes and stories consistent with the new direction.

7.8 Limitations and future research

In summary, this research has a number of limitations which have been discussed within the context of each study and may be addressed through future research. Firstly, organizational culture was assessed on the basis of returned expeditioners’ perceptions of Antarctic station values and norms, rather than “actual culture” as it would be determined by independent observers. Secondly, this research comprises a case study of Australian Antarctic expeditions and further research is required to determine the extent to which findings may be applicable to other international Antarctic stations. Further research may also extend the findings of this research by identifying the extent to which Australian Antarctic station culture and the links identified between subjective fit perceptions,

person-organization fit (OCP), gender, personality, perceptions of organizational behavioural norms (OCI), and job outcomes, also apply to: (i) other international Antarctic stations; (ii) organizations in isolated and confined teams in other extreme environmental settings; and (iii) organizations in business settings.

APPENDICES

APPENDIX A1: Gender on Ice

Conference on women in Antarctica held in Hobart, Tasmania (19-21 August 1993).

Conference aims and objectives:

- To provide an historical overview of the role of women in Antarctica and their participation in Australian National Antarctic Research Expeditions (ANARE);
- analyse the management issues raised by the introduction of women in what had been until then traditionally male arenas;
- examine the idea of leadership and gender differences if any, in this;
- provide a cross-fertilisation of ideas with other industries;
- encourage international discussion of the issue; and
- provide recommendations for future Australian Antarctic expeditions on the management of men and women in the Antarctic.

APPENDIX A2: EEO Recommendations

Recommendations formulated at the 1993 Conference on Women in areas apart from Selection and Recruitment:

Pre-embarkation Training

1. It is recommended that the quality and quantity of coverage of station community life skills training, including conflict resolution, personal assertion skills and effective gender relations, be at least the equivalent of field skills training. A two-day course of EEO and personal harassment (including anti-sexual harassment) training would be appropriate, and should be mandatory as is first aid training.
2. It is recommended that particular care and attention be paid to congruence of leadership and modelling with EEO and anti-discrimination policy and training by Antarctic Division and senior ANARE personnel.
3. It is recommended that special measures be taken to ensure that the positive contribution to station community life of returning expeditioners is valued and the negatives acknowledged confronted and controlled.
4. It is recommended that all expeditioners be provided with a document recording their briefing on behaviours which are specifically prohibited on station, and that this spells out that 'girlie posters' and other sexually harassing elements of ANARE culture are no longer acceptable or allowed. This could be provided as a record of signing the ANARE Code of Personal Conduct.
5. It is recommended that a detailed review of current applicability of exemptions from expeditioner training be immediately undertaken to close the loopholes which allow expeditioners to exclude themselves from awareness raising demanded by progressive changes in policy.
6. It is recommended that there be an urgent review of films used in expeditioners field training to cut out inappropriate sex role stereotyping and other gender-based offensive material.

Expeditioner Assessment and Responsibility

1. It is recommended that all expeditioners be assisted to understand the implications for the Antarctic Division and for ANARE of the Public Service Act and Commonwealth anti-discrimination legislation, and that their demonstration of a working knowledge of these in station life be part of the expeditioner assessment process.
2. It is recommended that present station communities be invited to participate with the Antarctic Division in the development of progressive steps in effective station relations management and complaints handling procedures. In order to support this initiative station personnel will require training in discussion group dynamics and facilitation.
3. It is recommended that any expeditioner who is proved, known or reasonably believed to have contravened the EEO and/or anti-sexual harassment standards of the Antarctic Division and ANARE without equivalent evidence of significant attitudinal behaviour change, shall be informed and excluded from future expeditions. Formal procedures will need to be negotiated between the Antarctic Division and representatives of the relevant employee organizations. The principles of natural justice apply.

Sexual Harassment Reportage and Complaints Handling

1. It is recommended that all station leaders and their managers be trained in the Antarctic Division's sexual harassment reporting and complaints handling procedures, and be equipped to address any misunderstandings about the applicability on Antarctic stations of Australian Public Service and Commonwealth anti-sexual harassment legislation.
2. It is recommended that all recent past and present ANARE expeditioners be advised of changes to the law to allow group action in sexual harassment complaints, and that they be advised of the procedures available to take such action, including taking action through the Antarctic Division's sexual harassment contact officer network.
3. It is recommended that expeditioners be advised that formal sexual harassment reports may be verbal and made directly to the Human Rights and Equal Opportunity

Commission as well as to the station leader and the Antarctic Division sexual harassment contact officers.

Sanctions

It is recommended that actual and perceived barriers to applying existing sanctions be removed, and that a clear statement of these sanctions be made to all expeditioners. This requires that practical and feasible sanctions be developed, applied and enforced throughout the expedition life cycle.

Social Science Research

It is recommended that social science research programs focussing on group dynamics, community function and reintegration of expeditioners, as well as individual and group psychology, be actively solicited by the Antarctic Division and research institutions for funding.

APPENDIX A3: ANARE selection process *

Stage 1 Registration and short-listing

- On receipt, applications are registered and an acknowledgment letter is sent to the applicant within two weeks.
- Applications are sent to the selection advisory committee (the committee that assesses each application against the advertised selection criteria) and applicants considered to best meet the selection criteria are short-listed for interview.
- The Confidential Checklist of Medical History for those on the short-list is then assessed by the Polar Medicine Branch to identify medical conditions which may preclude selection.
- The committee then prepares a short-listing report for approval by an appropriately authorised officer (the delegate). When the report is approved, those applicants not included in the short-list are advised in writing.
- This stage is completed 1 to 2 months after the closing date for applications.

Stage 2 Interviews

- Interviews are usually held shortly after the completion of stage 1.
- The interview is usually conducted in the capital city nearest the applicant's home.
- The interview assists committees to further assess applicants' technical expertise and personal qualities for working in Antarctica. After all interviews are completed, the committee prepares an interview report. The report explains why certain applicants are not being considered further and provides details of those who are to proceed to the next stage.
- Applicants not listed for further consideration are advised in writing at this time.

Stage 3 Post interview arrangements and final report

- Applicants complete a medical examination and adaptability assessment, and pre-employment checks may be carried out.
 - The committee prepares a final report, which includes details of preferred applicants. When this report is approved, applicants not selected are advised in writing and offers of employment are made to successful applicants.
 - This stage usually occurs 1 to 2 months after the interview.
-

* Taken from the Australian Antarctic Division's Internet site on ANARE employment opportunities in Antarctica.

APPENDIX A4: Approved ASAC³⁴ Projects for season 1999/00³⁵

Program - Human Biology and Medicine

1. DR Des LUGG, Australian Antarctic Division
“Human interaction with the Antarctic environment”.
2. PROF Konrad MULLER, University of Tasmania
“Analysis of immunity in Antarctic expedition personnel”.
3. DR Peter SULLIVAN, Australian Antarctic Division
“ANARE Health Register”.

³⁴ Antarctic Science Advisory Committee.

³⁵ Copy of official list published on the Australian Antarctic Division's Internet site on 10/26/99:
www.antdiv.gov.au/science/projects/9900.

APPENDIX B1:

Symbols, heroes, rituals, and stories characteristic of Antarctic station culture identified by a participant of the 1950-51 ANARE expedition to Macquarie Island.

Station Position: Weather Observer (X-navy)

Symbols:

We only had 6 movie films one was *Pride & Prejudice*, so we learnt the dialogue & quoted it to each other all the time in conversation. Pictures adorned the huts of centrefold "Man" magazines. Some had nicknames eg., dungy, we all tried different beard styles e.g., King George V, some people only cultivated one side of their face. Hair was close cropped.

Heroes/Legends:

Mawson - "Home of the Blizzard" all books read. General Antarctic past was widely accepted - no alive models presented themselves in 1950 & we had little knowledge of the world outside.

Rituals:

We celebrated every Birthday with a "sing", we even celebrated any event that turned up on the calendar. Midwinter was our Xmas- big "ding." Movie nights - we only had 6 - so we played them forwards, backwards & stopped them to view the opposite side but burnt out too many bulbs. Built an epidiastroscope to view photos, pages out of "Man" Magazines.

Stories:

Stories - debates - discussion whether women should be on bases -general consensus was that it would not work (under our living conditions) - what rules? Everybody went through a stage of withdrawal - certain mannerisms created heated discussions - eating habits of certain people -each individual had the same place at each meal & observed the person opposite draining his soup through his beard, leaving the soiled matter in his beard & the liquid returning to his bowl - do you want any more stories?

Values:

Mature team work, endeavour to check the personality which is the make-up of the individual. Attitudes whether they can be changed, past history (personal), self

motivations, self discipline, hygiene (personal), people who have a history of working with others at all levels. Positive mental attitude.

Advice on fitting in to station culture

He /she would have to be prepared for a change & be adaptable to change. Be very tolerant to other people's personality as each individual would have different needs & living & working in a small community requires an understanding beyond that found in work/living situations where you can get away. Twelve months is a long time living & working together.

The most salient aspects of Australian Antarctic/sub Antarctic stations

The station itself? Pleasant open spaces to work, live & socialise with other members. Be able to do your own work without restriction, but abide by the requirements of the station. One must be able to "get away" from the group at times so that the individual could do his/her own thing.

APPENDIX B2: A list terms and meanings.

“Bios” (Biologists)

“Blizzed in”(Blizzard outside)

“Boffin” (Scientists)

“Bolos” (Burnt out left overs)

“Dieso” (Diesel mechanic)

“Donga” (Bedroom)

“Dog Line” (in reference to Antarctic Dogs)

“Fort Knox” (Grog store)

“Homers” (Home brewed beer)

“Jolly” (Trip)

“JAFA” (Just another f..king academic)

“OIC” (Officer in charge)

“RTA” (Return to Australia)

“Slotted” (in reference to tractors/transport getting stuck in the snow)

“SNAFU” (Situation normal all fouled up)

“Slushy” (Cooks assistant)

“Tradies” (tradesmen/trade workers))

“Ventiles” (Antarctic clothing)

“Wov” (Wanted on voyage)

“White out”(Fog)

“Wyssa/Wizza”(Telegraph code: I love you darling/Lots of love -message from home).

APPENDIX C1: Additional Demographic information (Study II).

	N	%
Mean Age (in years)	39.79	
standard deviation	6.33	
Age Group		
30-34 years	2	14.3
35-39 years	6	42.9
40-44 years	3	21.4
45-49 years	1	7.1
50 or more	2	14.3
Educational Background		
Secondary school only	1	7.1
Associate/technical degree or diploma	2	14.3
Bachelors degree	4	28.6
Post graduate	7	50.0
No. of Expeditions (per person)		
1	8	57.1
2	4	28.6
3	2	14.3
Mean	1.57	
Type of Expedition		
Winter	9	64.3
Summer only	5	35.7

APPENDIX D1: Number of expeditions per person (Study III).

Number of Expeditions (per person)	N	%
1	50	42.7
2	38	32.5
3	6	5.1
4	11	9.4
5	6	5.1
6	4	3.4
7	2	1.7
Total	117	100

APPENDIX D2: Frequency distribution of expedition year(last).

Year of Expedition (Last)	N	%
1950	1	.9
1951	2	1.7
1953	1	.9
1954	1	.9
1955	1	.9
1957	1	.9
1958	2	1.7
1959	3	2.6
1960	1	.9
1962	3	2.6
1963	4	3.4
1964	2	1.7
1965	2	1.7
1966	4	3.4
1967	3	2.6
1968	2	1.7
1969	1	.9
1970	3	2.6
1971	2	1.7
1972	1	.9
1973	1	.9
1974	2	1.7
1975	5	4.3
1976	1	.9
1977	3	2.6
1978	3	2.6
1979	3	2.6
1980	2	1.7
1981	2	1.7
1982	1	.9
1983	1	.9
1985	2	1.7
1986	2	1.7
1987	2	1.7
1988	3	2.6
1989	3	2.6
1990	4	3.4
1991	2	1.7
1992	3	2.6
1993	5	4.3
1994	3	2.6
1995	5	4.3
1996	6	5.1
1997	10	8.5
1998	2	1.7
1999	1	.9
Total	117	100

APPENDIX D3: Organizational Culture Profile I

Instructions

This procedure is designed to assist you to arrive at a standardized description of the values and culture of Australian Antarctic stations. Important values may be expressed in the form of *norms* or shared expectations about what is important, how to behave or what attitudes are appropriate.

You have been provided with a pack of 54 Cards, on each of which is printed a value which you may, or may not, consider to be characteristics of Australian Antarctic stations. Please sort these values into 9 ordered categories according to the extent to which, in your view, the values are characteristic of the culture of Australian Antarctic stations. There is also a smaller pack of 9 cards which together represent a scale ranging from 9 “most characteristic of Antarctic culture” to 1 “least characteristic of Antarctic culture” as illustrated below.

9	8	7	6	5	4	3	2	1
Most characteristic of Antarctic culture								Least characteristic of Antarctic culture
(2)	(4)	(6)	(9)	(12)	(9)	(6)	(4)	(2)

The top number on each of the 9 category cards indicates the position of that category on the scale. At the bottom of each card is another number in brackets eg., (2), which represents the number of cards you are required to finally place in that category.

It is suggested that you lay out the 9 category cards on a table and then sort the value cards below each by making a number of runs through the pack. On the first sort you might use just two or three categories. On successive sorts you will be able to allocate the cards more precisely until finally you end up with the required number of cards in each category.

When you are satisfied with your sort please secure together the cards in each separate category and the card indicating the scale value, with an elastic band and place in the return envelope.

APPENDIX D4: Organizational Culture Profile Item set

1. Flexibility
2. Adaptability
3. Stability
4. Predictability
5. Being innovative
6. Being quick to take advantage of opportunities
7. A willingness to experiment
8. Risk taking
9. Being careful
10. Autonomy
11. Being rule oriented
12. Being analytical
13. Paying attention to detail
14. Being precise
15. Being team oriented
16. Sharing information freely
17. Emphasizing a single culture throughout the organization
18. Being people oriented
19. Fairness
20. Respect for the individual's right
21. Tolerance
22. Informality
23. Being easy going
24. Being calm
25. Being supportive
26. Being aggressive
27. Decisiveness
28. Action orientation
29. Taking initiative
30. Being reflective
31. Achievement orientation
32. Being demanding
33. Taking individual responsibility
34. Having high expectations for performance
35. Opportunities for professional growth
36. High pay for good performance
37. Security of employment
38. Offers praise for good performance
39. Low level of conflict
40. Confronting conflict directly
41. Developing friends at work
42. Fitting in
43. Working in collaboration with others
44. Enthusiasm for the job
45. Working long hours
46. Not being constrained by many rules
47. An emphasis on quality
48. Being distinctive-different from others
49. Having a good reputation
50. Being socially responsible
51. Being results oriented
52. Having a clear guiding philosophy
53. Being competitive
54. Being highly organized

APPENDIX D5: Organizational Culture Profile II

Instructions

This procedure is designed to assist you to arrive at a standardized description of the ideal organization.

You have been provided with a pack of 54 Cards, on each of which is printed a value which you may, or may not, consider desirable in an organization. Please sort these values into 9 ordered categories according to indicate your personal preference for each value in your ideal organization. There is also a smaller pack of 9 cards which together represent a scale ranging from 9 “most desirable” to 1 “least desirable” as illustrated below.

9	8	7	6	5	4	3	2	1
Most desirable								Least desirable
(2)	(4)	(6)	(9)	(12)	(9)	(6)	(4)	(2)

The top number on each of the 9 category cards indicates the position of that category on the scale. At the bottom of each card is another number in brackets eg., (2), which represents the number of cards you are required to finally place in that category.

It is suggested that you lay out the 9 category cards on a table and then sort the value cards below each by making a number of runs through the pack.

When you are satisfied with your sort please secure together the cards in each separate category and the card indicating the scale value, with an elastic band and place in the return envelope.

APPENDIX D6: O'Brien Scale items

Having a say about the way I did things in my job.

Being able to change the things I didn't like about my job.

The chance to use my abilities in my job.

The people I talked to, and worked with in my job.

The chance to get to know other people in my job.

The chance to learn new things in my work.

The amount of change and variety in my job.

The chance to do different jobs.

Being able to do my job without a supervisor.

Having enough time to do my job properly.

Chances of really achieving something worthwhile.

The amount of pay I got.

Promotion opportunities.

Quality supervision.

Physical conditions at work (cleanliness, noise levels).

The amount of pressure or stress.

Opportunities to do challenging and interesting work.

Opportunities to grow as a person and be your self.

APPENDIX D7: Cohesion scale items *

1. There is a great deal of trust among members of my work group.
2. Members of my work group work together as a team.
3. The members of my work group are cooperative with each other
4. Members of my work group know that they can depend on each other
5. The members of my work group stand up to each other.
6. The members of my work group regard each other as friends.

* In this study, “my work group” was replaced by “my station” and each statement was worded in the past tense to ensure participants referred specifically to Antarctic station life when they responded to each statement.

APPENDIX D8: Results of Factor Analysis *

OCP Item	Innovation Factor 1	Stability Factor 2	Respect for People Factor 3	Outcome Orientation Factor 4	Attention to detail Factor 5	Team Orientation Factor 6	Aggressiveness Factor 8
Innovation	.76	-.08	-.06	.07	.00	.12	-.04
Opportunities	.50	-.23	-.09	.07	-.01	-.03	.22
Experimenting	.76	-.03	.04	-.15	-.11	-.06	-.06
Risk taking	.76	-.08	.02	-.08	-.13	.04	.07
Careful	-.48	.27	.09	-.14	.24	-.16	-.22
Rule oriented	-.45	.40	.13	-.02	.14	-.16	-.18
Stability	-.09	.75	.08	-.11	.01	-.01	.06
Predictability	-.39	.55	.04	-.10	.03	-.06	-.03
Security	-.23	.63	.09	-.06	-.25	-.12	-.17
No rules	.18	-.41	.09	-.20	-.11	-.03	.32
Respect for individual	-.05	.06	.75	-.04	-.12	.00	-.14
Fairness	.01	.06	.68	-.03	-.03	.07	-.10
Tolerance	-.13	.04	.49	-.28	-.06	.02	.11
Achievement oriented	.01	-.08	-.07	.73	-.04	.00	-.03
Action oriented	.14	.04	-.05	.49	-.11	-.09	.34
High expectations	-.02	-.33	-.15	.41	.05	-.01	.03
Results oriented	-.02	-.06	.04	.71	.00	.02	.10
Precise	-.08	.03	.06	-.05	.74	-.19	-.01
Attention to detail	-.16	.02	.06	.00	.70	-.07	.00
Analytical	-.04	-.13	-.10	-.02	.55	.06	-.01
Team oriented	.14	-.06	.03	-.02	-.07	.69	.12
Collaboration	.00	-.22	-.03	-.01	-.15	.58	-.06
People oriented	.10	.03	.33	-.05	-.17	.48	-.11
Aggressive	.13	-.17	-.24	.22	-.02	-.24	.42
Competitive	-.04	-.25	-.19	.14	-.06	.02	.49
Socially responsible	-.13	-.03	.12	-.08	-.05	.22	-.63
Eigenvalues	6.75	4.14	2.20	2.12	1.84	1.69	1.54
Proportion of Variance	.13	.08	.04	.04	.03	.03	.03

* The data represent 826 accountants in 7 different firms (O'Reilly et al., 1991). The data in bold represent loadings greater than .04 on that factor

APPENDIX E1: The 12 OCI subscales and cultural styles they represent.

(1) Humanistic-Encouraging - organizations that are managed in a participative and person-centred way. Members are expected to be supportive, constructive, and open to influence.

(2) Affiliate - organizations that place a high priority on constructive interpersonal relationships. Members are expected to be friendly, open, and sensitive to the satisfaction of the group.

(3) Approval - organizations in which conflicts are avoided and interpersonal relationships are pleasant-at least superficially. Members feel that they should agree with, gain the approval of, and be liked by others.

(4) Conventional - organizations that are conservative, traditional, and bureaucratically controlled. Members are expected to conform, follow rules, and make a good impression.

(5) Dependent - organizations that are hierarchically controlled and non-participative. Centralized decision-making in such organizations means members do only what they are told and clear all decisions with superiors.

(6) Avoidance - organizations that fail to reward success but punish mistakes. This means members tend to shift responsibilities to others in order to avoid blame for mistakes.

(7) Oppositional - organizations in which confrontation prevails and negativism is rewarded. Members gain status and influence by being critical and tend to oppose new ideas and make safe decisions.

(8) Power - non-participative organizations structured on the basis of authority. Members believe they will be rewarded for taking charge, controlling their subordinates and being responsive to the demands of superiors.

(9) Competitive - organizations in which winning is valued and members rewarded for outperforming each other. Members operate in a “win-lose” framework and believe they need to work against peers in order to personally succeed.

(10) Perfectionistic - organizations in which perfectionism, Persistence, and hard work are valued. Members believe they must avoid all mistakes, keep track of everything, and work long hours to attain narrowly defined objectives.

(11) Achievement - organizations that do things well and value members who set and accomplish their own goals. Members set challenging but realistic goals, establish plans to achieve their goals, and pursue them with excellence.

(12) Self-Actualizing - organizations that value creativity, quality over quantity, task accomplishment and individual growth. Members are encouraged to enjoy their work, develop themselves, and take on new and interesting activities.

APPENDIX E2: The 3 OCI factors *

1. **Constructive** cultures in which members are encouraged to interact with others and approach tasks that will help them meet their higher-order *Satisfaction* needs, characterized by norms and expectations for Humanistic-Encouraging, Affiliative, Achievement and Self-Actualizing (11,12,1,2).
2. **Aggressive/Defensive** cultures in which members are expected to approach tasks in forceful ways that will not threaten their own *security*, characterized by norms and expectations for Oppositional, Power, Competitive, and Perfectionistic (7,8,9,10).
3. **Passive/Defensive** cultures in which members believe they must interact with *people* in ways that will not threaten their own security, characterized by norms and expectations for Approval, Conventional, Dependent and Avoidance (3,4,5,6) (Cooke and Rousseau, 1988; Cooke, 1989).

* the representative subscales are listed in parentheses.

APPENDIX E3: The OCI

Organizational Culture Inventory: *Survey Report: in Australians in Antarctica PhD thesis by Aspa Sarris, University of Adelaide, 2002.* RA Cooke & JC Lafferty, Human Synergistics

NOTE:

This publication is included in the print copy
of the thesis held in the University of Adelaide Library.

APPENDIX E4: The 6 item subscales adapted from the OCI*

Role clarity:	Did you clearly know what was expected of you as a station member?
Role conflict:	Did you receive inconsistent messages regarding what was expected?
Fit:	Did you feel you comfortably “fitted in” as a member of the station?
Accommodation:	Did your job require you to think and behave differently than would otherwise be the case?
Satisfaction:	Were you satisfied being a member of the station?
Recommendation:	Would you recommend Antarctica to someone like yourself as a good place to work?

*Each item is rated using a 5-point Likert scale ranging from 1 “Not at all” to 5 “To a very great extent”.

APPENDIX F1: The 5 Domains of the NEO PI-R *

Neuroticism - refers to the general tendency to experience negative affects, including fear, sadness, embarrassment, anger, guilt and disgust. Persons high in this domain are prone to have irrational ideas, cope poorly with stress, and are less able to control their impulses. Although this domain provides a measure of normal personality and should not be viewed as a measure of psychopathology, high scorers may be at risk for some psychiatric problems (Costa and McCrae, 1992)

Extraversion - refers to the general tendency to be sociable, prefer large groups and gatherings and exhibit assertive, active and talkative behaviour. Persons high on this domain tend to like excitement and stimulation, are cheerful in disposition, energetic and optimistic. Introversion refers to the absence of extraversion rather than its opposite. Introverts are more likely to be reserved rather than unfriendly and independent rather than followers. Though they are not shy or unhappy and do not necessarily suffer from social anxiety, introverts generally prefer to be alone (Costa and McCrae, 1992).

Openness - elements of this domain include an active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, intellectual curiosity and independence of judgment. Open individuals tend to be curious, are willing to entertain novel ideas and unconventional values, and tend to experience positive and negative emotions more keenly than closed individuals. Individuals who score low on this factor tend to be conventional in behaviour and conservative in outlook, have a narrower outlook and intensity of interests, and prefer familiar rather than novel experiences (Costa and McCrae, 1992).

Agreeableness - refers to interpersonal behaviour, including the tendency to be altruistic in one's outlook, cooperative in their dealings with others, sympathetic and helpful towards others, and eager to help, believing that others will be equally helpful towards them in return. In contrast, individuals who are disagreeable tend to be egocentric, sceptical of others' intentions, and competitive rather than cooperative. High scores on this domain are associated with Dependent Personality disorder (Costa and McCrae, 1990) whereas low scores are associated with Narcissistic, Antisocial, and Paranoid Personality disorders (Costa and McCrae, 1992).

Conscientiousness - refers to individual differences in self control in terms of the active process of planning, organizing and carrying out tasks. Conscientious individuals tend to have a strong will to achieve, are purposeful, strong-willed and determined. This trait is particularly associated with individuals who are successful in careers such as music and athletics. High scores on this domain typically punctual and reliable, whilst low scorers are more lackadaisical.

* As defined by Costa and McCrae (1992).

APPENDIX F2: The NEO PI-R Facet Scales *

Neuroticism Facets

- N1: Anxiety* - high scorers are anxious, fearful and apprehensive. Low scorers are calm and relaxed.
- N2: Angry Hostility* - refers to the tendency to experience anger, frustration and bitterness.
- N3: Depression* - the tendency to experience negative affect, including, guilt, sadness, and helplessness.
- N4: Self-Consciousness* - high scorers are sensitive to ridicule and prone to feelings of inferiority.
- N5: Impulsiveness* - the inability to resist cravings and urges (eg., food, cigarettes and possessions).
- N6: Vulnerability* - refers to vulnerability to stress and panic, particularly in difficult circumstances.

Extraversion Facets

- E1: Warmth* - tendency to like others and to be friendly and affectionate.
- E2: Gregariousness* - a preference for other peoples company.
- E3: Assertiveness* - the tendency to appear dominant and forceful.
- E4: Activity* - high scorers lead fast and busy lives, whilst low scorers have a more relaxed attitude.
- E5: Excitement-Seeking* - the tendency to seek excitement and stimulation.
- E6: Positive Emotions* - the tendency to experience positive emotions.

Openness Facets

- O1: Fantasy* - ability to be have an active imagination and be open to fantasy.
- O2: Aesthetics* - high scorers tend to appreciate art and beauty.
- O3: Feelings* - ability to be receptive to one's own emotions and consider emotional states as important.
- O4: Actions* - a willingness to try new activities, to go to new places and to try new foods
- O5: Ideas* - tendency to be intellectually curious and open-minded towards new ideas.
- O6: Values* - ability to re-examine one's values.

Agreeableness Facets

- A1: Trust* - the tendency to believe that others are honest and have good intentions..
- A2: Straightforwardness* - the ability to be frank, sincere and ingenuous.
- A3: Altruism* - tendency to demonstrate generosity and concern toward those needing help.
- A4: Compliance* - ability to inhibit aggression and to forgive and forget.
- A5: Modesty* - the ability to be humble and self-effacing.
- A6: Tender-Mindedness* - tendency to be sympathetic towards and show concern for people.

Conscientiousness Facets

- C1: Competence* - the extent to which one is capable, sensible, prudent and effective.
- C2: Order* - the tendency to be highly organized.
- C3: Dutifulness* - the tendency to be governed by conscience.
- C4: Achievement Striving* - to have high aspiration levels.
- C5: Self-Discipline* - the ability to begin tasks and see them through to completion.
- C6: Deliberation* - the tendency to think carefully before acting.

This s a brief summary of the six scales based. Refer to Costa and McCrae (1992) for a more detailed summary of each scale

APPENDIX F3

NEO PI-R Facet scale mean scores; Australian Antarctic sample and Normative sample.

	Normative Mean (SD)		Antarctic Expeditioners Mean (SD)	
	Men <i>n</i> =500	Women <i>n</i> =500	Men <i>n</i> =500	Women <i>n</i> =14
Neuroticism				
1. Anxiety	13.3 (4.9)	15.4^a (5.4)	12.6 (4.5)	12.8^b (4.7)
2. Angry Hostility	12.2^a (4.5)	12.6 (4.8)	10.8^b (4.2)	12.5 (4.1)
3. Depression	11.6 (5.2)	12.9^a (5.6)	10.9 (4.5)	10.1^b (4.9)
4. Self-Consciousness	13.7 (4.3)	15.0 (4.5)	12.9 (4.0)	14.7 (4.9)
5. Impulsiveness	15.3^a (4.2)	16.3 (4.6)	14.2^b (4.0)	15.7 (3.9)
6. Vulnerability	9.2 (3.7)	10.9^a (4.0)	8.26 (3.3)	8.4^b (2.6)
Extraversion				
1. Warmth	22.3 (4.0)	23.6 (3.8)	22.1 (4.1)	23.7 (3.9)
2. Gregariousness	16.0^a (4.9)	17.0 (4.7)	14.3^b (4.9)	15.6 (5.3)
3. Assertiveness	16.3 (4.7)	15.4 (4.8)	16.1 (4.8)	17.3 (4.6)
4. Activity	17.3 (4.3)	17.8 (4.4)	17.0 (4.0)	18.0 (4.7)
5. Excitement-Seeking	17.2^a (4.7)	15.7 (5.1)	15.0^b (3.9)	14.3 (4.5)
6. Positive Emotions	19.5 (4.3)	20.8^a (4.5)	19.5 (5.3)	23.9^b (3.3)
Openness				
1. Fantasy	17.0 (4.7)	16.2^a (5.0)	17.0 (4.8)	19.2^b (3.7)
2. Aesthetics	16.7^a (5.4)	18.5 (5.1)	18.3^b (6.0)	20.5 (4.9)
3. Feelings	19.7 (3.8)	20.8 (4.1)	20.2 (4.1)	22.8 (3.1)
4. Actions	16.1^a (3.8)	16.8^a (3.6)	18.3^b (4.0)	19.8^b (3.1)
5. Ideas	19.8 (5.0)	18.2^a (5.0)	20.8 (5.0)	21.7^b (5.9)
6. Values	20.8^a (4.5)	20.5^a (3.8)	22.2^b (3.7)	25.1^b (3.0)
Agreeableness				
1. Trust	20.9^a (4.3)	21.7 (4.0)	22.6^b (3.4)	22.3 (4.4)
2. Straightforwardness	20.3^a (4.3)	22.2 (4.3)	22.4^b (4.0)	22.0 (4.0)
3. Altruism	22.8 (3.6)	24.3 (3.2)	23.4 (2.9)	24.8 (2.2)
4. Compliance	18.1^a (3.7)	19.6 (4.1)	19.9^b (3.7)	20.3 (4.1)
5. Modesty	18.1^a (4.4)	19.7 (3.8)	19.6^b (4.2)	19.9 (5.3)
6. Tender-Mindedness	19.9^a (3.8)	21.0 (3.1)	21.3^b (3.3)	21.7 (3.1)
Conscientiousness				
1. Competence	22.5 (3.5)	21.8^a (3.5)	22.3 (3.2)	23.8^b (3.2)
2. Order	18.9 (4.1)	19.1 (4.2)	18.4 (4.3)	18.6 (2.8)
3. Dutifulness	23.2 (3.9)	23.2 (3.8)	23.9 (3.4)	24.3 (2.5)
4. Achievement Striving	19.3 (4.1)	19.6 (3.9)	19.3 (3.6)	19.2 (3.5)
5. Self-Discipline	21.8 (4.2)	21.7 (4.4)	21.3 (4.2)	22.5 (3.8)
6. Deliberation	17.8 (4.0)	17.3 (4.3)	18.2 (3.6)	18.1 (4.8)

^{ab} Indicates a statistically significant difference between a pair of same sex mean scores.

APPENDIX F4

Intercorrelations of 3 OCI Culture Factors and NEO PI-R Facet scales.

	Satisfaction	People-security	Task-security
Neuroticism			
7. Anxiety	-.01	.08	-.02
8. Angry Hostility	-.13	.05	.07
9. Depression	-.06	.07	.00
10. Self-Consciousness	-.06	.05	-.04
11. Impulsiveness	-.15	.05	-.06
12. Vulnerability	-.21*	.23*	.05
Extraversion			
7. Warmth	.13	.13	.16
8. Gregariousness	-.09	.11	.07
9. Assertiveness	.13	.04	.14
10. Activity	.01	-.00	.14
11. Excitement-Seeking	.04	-.09	.03
12. Positive Emotions	.09	.01	.10
Openness			
7. Fantasy	.00	-.16	-.11
8. Aesthetics	.12	.01	.08
9. Feelings	.04	.02	.01
10. Actions	-.09	-.10	-.01
11. Ideas	.07	-.14	-.00
12. Values	-.01	-.14	-.22*
Agreeableness			
7. Trust	.30**	-.07	-.07
8. Straightforwardness	.13	-.01	-.04
9. Altruism	.11	.07	.09
10. Compliance	.13	.01	-.04
11. Modesty	.03	.15	.08
12. Tender-Mindedness	.07	.16	.12
Conscientiousness			
7. Competence	.23*	-.13	-.05
8. Order	.11	-.08	-.09
9. Dutifulness	.25**	-.08	.00
10. Achievement Striving	.19*	-.07	.02
11. Self-Discipline	.19*	-.05	-.06
12. Deliberation	.16	.01	.13

* $p < .05$, ** $p < .01$ (two tailed).

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