THE 'CLIMATES' OF THE LOGGING INDUSTRY - EFFECTS ON SAFETY, COMMITMENT, TURNOVER, AND ACCIDENTS.

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ABSTRACT

New Zealand's logging industry is one of the country's largest exporting industries. With increased global competition and demands, work environments like the logging industry are finding that problems such as accidents and turnover rates are intensifying. Much research has been completed on accident and turnover rates, yet no decrease is apparent. New approaches in identifying reasons for such problems are therefore necessary. Gaining knowledge of the rationale for high turnover and accident rates (adverse activities) within the logging industry included investigating the general PC, group and organisational climate, safety climate, organisational commitment and intentions to quit (job behaviours/perceptions)of logging industry members. Field and Abelson's (1982) model asserts that PC can affect job behaviours/perceptions and adverse activities. Their 'new evolution' model of climate also argues that aggregation of psychological climate (PC) perceptions to gain evidence of group and organisational climate is possible if there is consensus in PC perceptions within groups and across organisations. Respondents were a heterogeneous group of contractors (n=6) and crew members (n=67) drawn from a list of Corporate and Woodlot crews provided by Carter Holt Harvey Limited and Fletcher Challenge Limited. The relationships between demographic variables and PC were examined using analysis of variance (ANOVA). ANOVA's and Pearson r's correlations were also performed to analyse potential relationships between all the variables to determine effects on the adverse activities of the logging industry. The psychological climate, safety climate, organisational commitment, and intentions to turnover variables were found to be rather negative in direction. Aggregation of PC to group level climate proved unfruitful because of the lack of consensus within crews. However, organisational climate was evident across the logging industry. Some PC variables were found to be significantly related to safety climate variables, organisational commitment variables, and intention to quit variables. The contractors perceptions of the PC variables role ambiguity and workgroup friendliness and warmth were significantly related to crewmember turnover rates. Moreover, the contractors perceptions of the safety climate variable fatalism were significantly related to crewmember accident rates. The research limitations and implications were discussed along with recommendations for future research.

"Work is a mysterious thing; many of us claim to hate it, but it takes a grip on us that is so fierce that it captures emotions and loyalties we never knew were there".

- Bob Greene, Tribune Media Services

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CHAPTER 1. OVERVIEW

1.1 The New Zealand logging industry

New Zealand forestry is made-up of three industries. The *silviculture industry* is involved in the process of growing and tending the trees; the *logging industry* involves harvesting these trees; and the *transportation industry* transports the cut logs from the forests to the customers. The harvesting of the trees concerns felling and delimbing trees, dragging or hauling the trees to a landing, cutting the stems into graded logs, and loading the logs onto trucks for transportation (Gibson, 1994). Although the logging industry is only a part of the whole forestry industry, it is also an important step in the process of one of New Zealand's largest export industries.

Two major problems have been identified within the logging industry by the Logging Industry Research Organisation (LIRO). These are the high number of fatalities and lost-time accidents (those accidents that cause the injured worker to miss, at least the next scheduled full day's work), and the high rate of turnover within the logging crews. Even with on-going research, the LIRO representatives have stated that these problems are not decreasing.

1.1.1 Accidents within the logging industry

LIRO has focused on various operations of the logging industry to combat the accident rate problem. Mechanisation, ergonomics, job and equipment redesign, training schemes, personnel characteristics and accident reporting schedules have all been researched, developed, and/or implemented by LIRO. Moreover, the New Zealand Government introduced two new Acts; the Accident Rehabilitation and

Compensation Insurance Act 1992 (ARCI Act) and the Health and Safety in Employment Act 1992 (HSE Act) to reduce costs for funding accident compensation schemes and improve work environment safety.

However, all logging industries, including New Zealand's, are considered very dangerous (International Labour Office, 1992), and even with continual research, remain so. These comments are illustrated in statistics from recent studies. Fatality rates within the logging industry in 1994 were 71 times higher than the national average, that is one in every 280 logging employees were killed (cited in Sullman, 1996). Also, 288 logging employees had lost-time accidents in 1994, that is one in ten (cited in Sullman, 1996). In a study by Parker (1995), it was found that an astounding rate of 14% of accidents led to more than 21 days of lost-time.

These very high rates of deaths, injuries, and time off work have caused a shift in the responsibility of compensation to individual employers and industries with poor accident records (Sullman, 1996). In turn, employers within the logging industry, and other employers in similar situations, have suffered increased demands from the Accident Compensation and Rehabilitation Corporation (ACC) for higher premium payments. Without any major subsistence of accident rates in sight, there is now a desperate need to discover a deeper level of understanding about the causes of such accidents.

As stated before, much research has gone into safety in the logging industry because of the high rates of accidents and its hazardous environment. However, little attention has been paid directly to psychological factors. As an obvious need for change is apparent, and with an abundance of conflicting results, it is time to change the focus to determine at least a partial explanation of the reasons for accidents. As Gibson (1994) states..."It appears that further research examining other possible interventions is required if any substantial impact on the accident rate in forestry is to be achieved" (p.4).

1.1.2 Turnover rates within the logging industry

LIRO has performed several studies within crews and the industry itself to obtain information on the high turnover levels within the logging industry. This research has produced startling data about the high rates of turnover. A study within the Kinleith region in 1988 (Bomford and Gaskin, 1988) showed a 48% annual turnover, while a study of the same area in 1993 by Adams showed an increase of annual turnover to 58%. It has also been found, in a study, completed in 1990, that more than half those members who left individual logging crews, also left the entire forestry industry (Tapp & Gaskin, 1990).

Adams (1993) found, in a seven year long study, that after three and a half years, only 13% of crewmembers in the Kinleith region remained in the same crew and 58% of loggers stayed in the industry for only one year. Along with relatively high turnover rates and low survival rates, there was found to be only 22% of crews that kept at least one of their original members after seven years. Gibson (1994) similarly found that over 50% of the employees in current teams had been members for less than two years.

Bomford, et al. (1988) aptly stated that, "An understanding of the levels, types and reasons for turnover is important to the industry for estimating future recruitment and training needs. Furthermore, turnover is an expensive aspect of manpower..." and Liley (1984) also indicated that there is a lack of knowledge about turnover in the logging industry.

1.2 The study of psychological factors within the logging industry

Slappendel, Laird, Kawachi, Marshall and Cryer (1993) reviewed research on why accident rates are so high and discovered that psychological and physiological characteristics may influence high injury rates. They also noted there was a need

for research to delve into the perceptions about safety forestry industries. Psychological aspects of forestry work and the psychological characteristics of the industry's workforce are, as a matter of fact, starting to shed light on accidents within the logging industry (Slappendel, et. al., 1993), as well as turnover levels within other industries (for example; Marini, Pell, & Black, 1992; Moore, Godbolt, Schwartz, Moriber, & Saltzberg, 1991; all cited in Schreuder, 1996; Parasuraman & Nachman, 1987; Riggar, Hansen, & Crimando, 1987).

This psychologically based research has focused mainly on *attitudes* of the workforce. However, these early attitudinal studies started coming under fire when Hale and Glendon (1987) stated that many studies assumed that attitudes were strongly linked to behaviour, even though there was very little empirical support for this link. Although there has been criticism about linking attitudes to behaviour by social psychologists (LaPiere, 1934; Wicker, 1969; cited in Gibson, 1994), recent research into 'climates' and 'cultures' has helped renew interest in employees' attitudes (Gibson, 1994). This new-founded search for knowledge of the workers' attitudes, or perceptions, has meant a shift from perceptions being seen as a means for identifying individual behaviours, to perceptions as a link to understanding the climates and behaviours within an organisation (Zohar, 1980; Cox & Cox, 1991; Dedobbeleer & Beland, 1991).

This growing need for recognising psychosocial and psychological factors within the logging industry has become important because of the realisation that high accident and turnover rates are not going away, despite constant world wide research efforts. The statistics show how really important it is to identify the perceptions, and consequently the 'climate', within the logging industry.

Due to the uncertain and unpredictable work environment of the logging industry that is affected not only by the domestic market, but also the international market there is a need for a higher priority to be given to research on accident and turnover issues. Given the above concerns, the present thesis is to be based around LIRO's

and the New Zealand Forestry Owners Association's (NZFOA) interests and needs. The main focus is on improving and maintaining the efficiency, productivity, safety, and profitability of the logging industry.

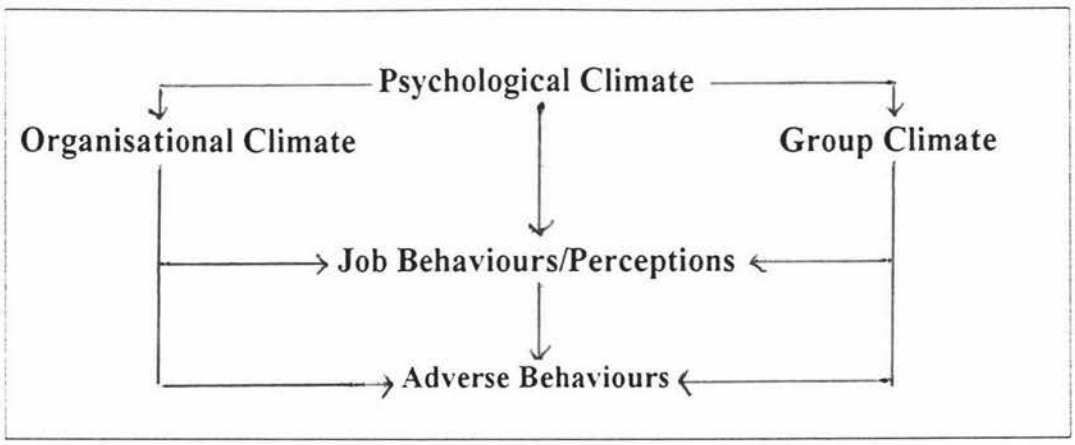
Few studies have been completed based on the psychological factors of the logging industry within New Zealand. This study will therefore focus on the psychological factors that make up its psychological climate. Helping LIRO and NZFOA gain an understanding of the 'climate' underlying logging may highlight alternative perspectives on the roots of the problems, thus raising questions and challenging traditional assumptions.

Climate has been defined as sets of measurable dimensions of a work environment, either perceived directly or indirectly by individuals, groups, or the organisation as a whole, which are assumed to influence their behaviours and/or motivation.

Various aspects of three 'climates' are of interest in the present study. First and foremost is psychological climate (PC), then group/crew climate and organisational climate (see Figure 1.1).

As is illustrated in Figure 1.1, psychological climate is the starting point of the present study. According to the 'new evolution', a recent theory pertaining to climate, group and organisational climate is dependent upon the extent of perceptual agreement among the individuals who make up the group or organisation (Field & Abelson, 1989; James & Jones, 1980). Even if there is no consensus among groups/organisations, then PC alone can affect job behaviour/perceptions and adverse activities. Moreover, Figure 1.1 illustrates that the job behaviour/perceptions can also affect adverse behaviours such as accident and turnover rates.

Figure 1.1: Model used in present study - the new evolution.



Adapted from Field and Abelson (1989).

The job behaviours/perceptions hypothesised as being affected by the logging industry's climates for the present study are safety climate, organisational commitment, and intentions to turnover. These three variables were thought to be appropriate behaviour related perceptions for research because of their already proven relationships with the logging industry's two major problems, accidents (*safety climate*; Cox et al., 1991; Dedobbeleer et al., 1991; Donald & Canter, 1994; Hofmann & Stetzer, 1996; Niskanen, 1994; Ostrom, Wilhelmesen, & Kaplan, 1993; Pidgeon, 1991; Weick, 1987; Williamson, Feyer, Cairns, & Biancotti, 1997; Zohar, 1980) and turnover (*organisational commitment*; Somers, 1995; Wood, 1994; and *intention to turnover*; Parasuraman, 1982).

Possible interactions and relationships will be sought between psychological climate and the job behaviours/perceptions. Other researchers have found that psychological climate variables (and those variables similar to the PC variables used in the present study) do affect organisational commitment (Billingsley & Cross, 1992; Cook & Wall, 1980; Luthans, Wahl, & Steinhaus, 1992). Moreover, perceptions of the work environment (those similar to the PC variables used in the present study) do affect intentions to turnover (for example; Marini, et al., 1992; Moore, et al., 1991; cited in Schreuder, 1996). Safety climate, however, is a sub-climate within itself. The present study utilises this climate as a job behaviour/perception because of its direct influence on accidents, and it has been

differentiated from psychological climate, as have other related concepts (Al-Shammair & Minwir, 1992; cited in Alpass, 1994).

1.3 Why study the logging industry's climates.

The concept of psychological climate has received a large amount of attention in the literature, both positive and negative. Knowledge of psychological climate has proven useful because it is the link in the chain to other organisational formations and has had utility in forecasting organisational situations. Forehand (1968) believed that the construct's utility resided in the fact that it is the product of person and environmental variables.

Creations of climate are formed through individual member's perceptions, selections, and interpretations. The climate, once developed, affects motives, behaviours, perceptions, and abilities (Forehand & Gilmer, 1964; Kaczka & Kirk, 1968; Lawler, Hall & Oldham, 1974; Lewin, Lippitt & White, 1939; Litwin & Stringer, 1968; Waters, Roach & Batlis, 1974; Pritchard & Karasick, 1973; the latter cited in Field, et. al., 1982). Forehand, et al. (1964) propose that climate affects behaviour/perceptions by: "(i) defining the stimuli which confront the individual, (ii) placing constraints upon the freedom of choice of behaviour, and (iii) rewarding and punishing behaviour" (p.193). Therefore, climate should be viewed as a systems variable to allow understanding of individual and group behaviour/perceptions within intricate social scenarios (Litwin, et. al., 1968; Tagiuri, 1968).

The above discussion on the effects of climate on individuals could be the reason why Guion (1973) stated that "The construct... may be one of the most important to enter the thinking of industrial-organisational psychologists in many years" (p.120). It is also the reason why the present study will focus on 'climates'.

To build an understanding of climate seems a necessary task for any organisation of the '90's. Individual employees cause an organisation to perform, either productively or inefficiently, thus taking measures to discern perceptions of the individuals is a step in the right direction for creating a better logging organisation/industry.

1.4 Chapter summary

Chapter 1 has established what is to be presented in the subsequent chapters. The two major problems of the logging industry, high accident and turnover rates have been introduced, and we were acquainted with the research that has consequently brought us to this study. The current theorising about climate and PC's intrinsic part within this evolution was briefly discussed. Safety climate, organisational commitment, intention to turnover, and the part that these variables play in the present research were introduced. The relationship between the present study's research variables, and their hypothesised influence on the logging industry's two major problems, were discussed and diagrammatically illustrated in part of Field et al.'s (1989) revised model of climate (Figure 1.1). Reasons for acquiring knowledge about the climate within the logging industry were discussed, as were the needs for understanding the climate of an organisation/industry in the nineties.

1.5 Organisation of the introduction

Chapter 2 of this thesis will provide an overview of five main approaches to defining and studying climate within a work environment. The 'new evolution' of climate within organisational behaviour theory will be introduced as the chosen approach for the present research.

There are three levels of climate according to the current thinking surrounding the

topic of the 'new evolution': psychological climate (PC), group climate (GC), and organisational climate (OC). Chapter 3 will introduce and discuss these 'climates'. According to Field, et al.'s model (1989; see Figure 1.1), psychological climate should be central to a discussion of the three types of climate. Each person has their own perceptions, thus organisational and group climate occur when consensus among individuals is strong. Therefore, this model is pivotal to the present study. Theoretical and empirical support for each level of climate will be also be presented.

In Chapter 3, an introduction to the research on PC, as it relates to the present study, will be presented. The chosen form of measurement will also be discussed. The present research investigates (PC) variables such as leader trust and support, leader goal facilitation, leader interaction facilitation, work-group co-operation, work-group friendliness and support, role ambiguity, role conflict, and job challenge and variety, as predictor variables. These selected PC variables were incorporated from the original version into a short-form questionnaire by James, James, and Ashe (1990) that, nevertheless, encompass the four components consistently utilised in studies of this kind. These four components are: role stress and lack of harmony; job challenge and autonomy; leadership facilitation and support; and work-group co-operation, friendliness and warmth. A brief account of the two-sided argument on aggregating PC will also be presented.

Chapter 4 considers safety climate, organisational commitment, and intention to turnover as 'job behaviours/perceptions'. Job behaviours/perceptions are those mechanisms that can be the moderators between two factors, as a link in a chain. According to the present study, they are the moderating variables between PC perceptions and adverse activities. Job behaviours/perceptions are created, first and foremost, by psychological climate. If homogeneity of PC perceptions is present within groups or organisations, then group and/or organisational climate also take part in the construction of the job behaviours/perceptions. Once created, these behaviours/perceptions sometimes work together with the climate variables to

affect physical activities, or, as translated into the present study's design, high turnover and accident rates.

Definitions of the job behaviours/perceptions, that is, safety climate, commitment, and intention to turnover, will be presented, as well as a literature review and discussion of measuring instruments chosen for this research.

CHAPTER 2. CLIMATES

2.1 Chapter overview

The first section of this chapter attempts to articulate the status of climate as a concept by presenting an etiology of climate. This section discusses the five main organisational approaches to climate formation: the structural approach; the selection-attraction-attrition (SAA) approach; the interaction approach; the cultural approach; and the perceptual approach. This chapter will also provide an introduction to the so-called 'new evolution' as an approach to climate formation.

2.2 The etiology of climate

The first of five main approaches to climate is the *structural approach.* Guion (1973) and Payne and Pugh (1983; cited in Alpass, 1994) state that climate is a function of the structure of an organisation and as such is an attribute of the organisation. It is considered that climate is formed through organisational members all being exposed to the same structural attributes (for example, the organisation's size, hierarchy, technology, rules and policies, and centralisation) within an organisation, and thus possessing the same perceptions of an organisation. Schneider and Reichers (1983) found two negative aspects of this approach. Empirically, there has been no consistency in studies to warrant the use of such an approach as the sole basis of research into the etiology of climate. Conceptually, this approach does not provide an illustration of the differences between levels within an organisation (or subclimates). Moran and Volkwein (1992) also found a weakness that is drawn from the fact that the structural approach ignores the "interpretative processes of groups" in the formation of

climate.

The second approach to climate formation is the *selection-attraction-attrition (SAA)* approach (Schneider, in press; cited in Schneider, et al., 1983). This approach views organisational processes, such as *selection* into an organisation, individual processes like the *attraction* to an organisation, and the *attrition* from an organisation, as amalgamating to produce comparatively homogenous members within an organisation. In other words, climates are created because of the similarities of the members themselves. Organisations attempt to attract those people that match up with organisational expectations, and individuals choose those organisations for particular reasons, thus are involved in the process of self-selection (Schneider, et al., 1983). Schneider, et al. (1983) identified the first problem with the SAA approach. They noted that its source of perceptions and meanings is all dependent on the individual. Like the structural approach, the second weakness of the SAA approach is that it does not fully account for differences in group climates or subclimates within organisations (Schneider, et al., 1983).

Thirdly, the *interactive approach* states that climate originates from interaction between work group members (Schneider, et. al., 1983), and is termed, "newcomer socialisation". Newcomer socialisation can be defined as the "the period of time during which new organisational members come to 'learn the ropes', or know, more precisely, what is expected of them and what organisation membership has to offer" (Schneider, et al., 1983). Socialisation is then said to cause a newcomer to 'pick up' the climate during this period through interactions with existing members. The emphasis on the importance of group membership in influencing the definition of every organisation's and group's climate provides an explanation of the genesis of different climates within one organisation. However, the interactive approach has been criticised for ignoring interactions which individuals have in the broader context.

The *cultural approach* is the fourth approach to the theory of formation of climate. Ashforth (1985; cited in Alpass, 1994) stated that a close relationship exists between the "shared perceptions" and the "shared assumptions" of climate and culture. There are noted similarities as above, but the basis of this approach has stemmed from anthropological roots, while climate developed from a social psychology framework (Glick, 1985). Another difference between the approaches is that 'cultural' authors have recognised multiple or subunit cultures in organisations, but lack the development of separate labels at the individual level of organisations. Climate research on the other hand has produced the concept of 'psychological climate' to represent the individual level. Culture within an organisation has been defined as "A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p.12, Stein, 1992). Therefore, the theory's main focus is on "the evolution of climate through a 'shared culture', created by groups interpreting, constructing and negotiating reality" (Alpass, 1994).

The fifth and last approach to be discussed in this section is the *perceptual approach.* The responsibility for formation of climate in this approach is placed completely on the individual members, rather than on organisational properties. Individuals within an organisation are said to have perceptions and interpret organisational policies, practices and procedures in psychologically meaningful terms (James & Jones, 1974). This approach is what James, et al., (1974) identify as Psychological Climate (PC). PC can be defined as "people's cognitive representations of proximal environments expressed in terms that represent the personal or acquired meaning of environments to individuals" (James & Sells, 1981, p.275), thus the unit of analysis is the individual (James & James, 1989; James & James, 1992; James, et al., 1974; Jones & James, 1979). Florin, Gianartino, Kenny, and Wandersman (1990; cited in Alpass, 1994) go on to identify PC as a measure of members perceptions of the characteristics and

processes within their organisation as an outcome of the interactions in the social element of the organisation. These characteristics and processes within an organisation are seen to be objective and to be durable paradigms (Reinstate, 1990; cited in Alpass, 1994).

When looking at the climate literature, one can see that numerous controversies, ambiguities, and methodological difficulties have plagued the construct. Guion (1973) has argued that climate was simply an alternative label for affective responses, similar to job satisfaction. Other issues concerned the appropriate level of conceptualisation and analysis of climate (for example, Glick, 1985; James, 1982) and whether it is an objective organisational property or subjective and perceptual (for example, Hellriegel & Slocum, 1974; James, et al., 1974).

Recent theory and research has, however, resolved most of these conceptual and methodological problems and has more fully articulated the role of climate. Building on the work of early climate researchers (Litwin, et al., 1968) and interactionists (Indik, 1968; Sells, 1963), the emerging theoretical perspective conceptualises climate as *sets of perceptually based descriptions of relevant organisational features, events, and processes* (James, et al., 1974; Jones, et al., 1979).

In this development, one can see a movement from what evolved originally as an organisational attribute, to an attribute that may be subsystem specific, and further to a subsystem that may be considered as a group or an individual perception. An introduction to the new approach to climate formation that incorporates these movements will now be presented.

2.3 Climate's new conceptionalisation

A shift from the five approaches of climate formation has led to a new theory on

multiple climates existing within organisations (Hellriegel, et al., 1974). Although the psychological or perceptual climate framework regards the formation of climate perceptions as primarily an individual-level process, it also has come to recognise that the process is interactive and reciprocal. That is, similar individuals are attracted to the same sort of settings, are socialised in similar ways, are exposed to similar features within contexts, and share their interpretations with others in the setting. Over time this process tends to result in consensus on climate perceptions. When consensus can be shown for climate perceptions referencing content at higher levels of conceptualisation, the perceptions can be aggregated to represent sub-unit- or organisational-level climate constructs (James, 1982).

According to Field, et al. (1989), identifying the existing climate of an organisation begins by detecting climate dimensions by analysis of *individual perceptions* of members of organisations. Scores from questionnaires developed for analysing individual or psychological climate can be aggregated. Thus psychological climate dimensions reflect the whole group/organisation experiences and perceptions which, in turn, reflect group and organisational climate. These ideas leave the impression that climate can be defined and operationalised on three levels of analysis within work environments, and this has, in turn, generated further arguments/discussions.

Criticism of this 'aggregation' process (i.e. Guion, 1973) has been forthcoming because of the problem that not all organisational members see climate dimensions in the same way. However, Field, et al. (1989) found that this approach to the climate construct was much more practical and operational. There now exists a large amount of research analysing psychological climate to gain an understanding of group and organisational climates. In turn, several researchers are in agreement that climates are determined by complex perceptions of organisational members (for example, Howe, 1977; Jones, et al., 1979).

In summary, climate exists at an individual level, and sometimes at group and/or

organisational levels. Evaluation of psychological climate is dependent on psychometrically sound instruments at an individual level. Group and organisational climates are said to rely on evaluations of PC showing small non-standardised within-group or organisational variance and/or larger between-group than within-group variance (Field, et al., 1989). Climate is therefore made up of three levels that have to be empirically supported on each level.

The following chapter presents part of the model to be used in the present study. Moreover, it describes a research summary relevant to the present study and the theoretical and empirical evidence concerning the construct validity of the three levels of climate.

CHAPTER 3. THE NEW EVOLUTION

3.1 Levels of climate

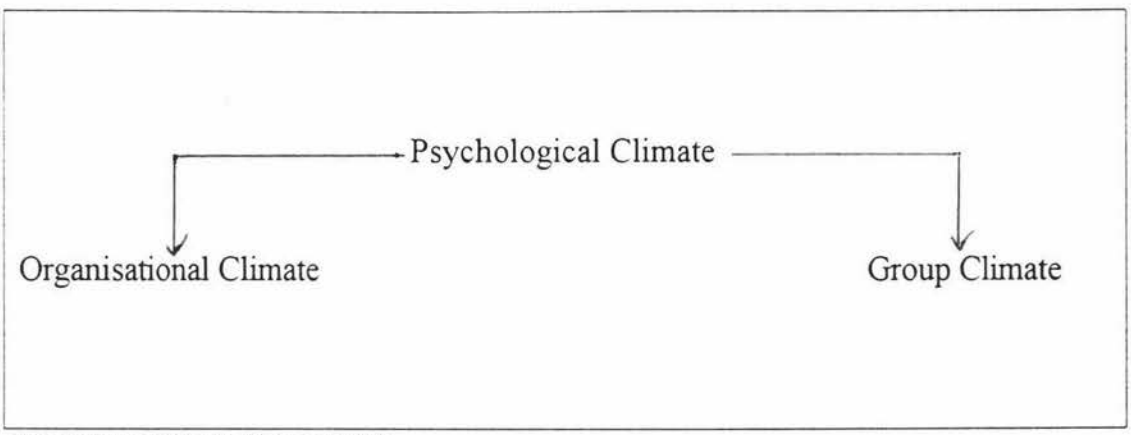
Three levels of climate, relevant to the present study, are illustrated in Figure 3.1. Research has supported this perspective, and the notion that group and organisational climate occur if there is consensus of individual perceptions by respective unit members (Gavin, 1975; Jones, et al., 1979; Joyce & Slocum, 1979; Kozlowski & Farr, 1988; Kozlowski & Hults, 1987; Newman, 1975).

The model used in the present study was developed by Field, et al. (1982) and was revised from a traditional model of climate by James, et al., (1974). The traditional model presented psychological climate as the origin of organisational climate perceptions. It was developed on the basis of a need for conceptual boundaries, variables, and dimensions that represent climate. Its evolution was also based around requirements for further development of organisational models, with the inclusion of the climate concept.

The revised model is similar, yet more theoretically sound and practical in relation to its use within organisations than the traditional model. It presents climate as a perceptual phenomenon through taking the place of organisational climate as the main focus. Group climate was added to the revised model, in which it has a similar role to organisational climate. Group and organisational climate occur only when there is a consensus of climate perceptions by unit members, though, as stated before, these consensual climates may not exist due to differing individual views within their different units.

Psychological climate has already been introduced in the previous chapter, but will now be presented in more detail, and as part of the present study. Organisational and group climate will also be introduced.

Figure 3.1 Climate section of the present study's model



Adapted from Field & Abelson (1989).

3.2 Psychological or individual climate (PC)

At this point, one must discuss psychological climate, as it is central to the model and the present study. As stated in the etiology of climate section, climate exists as an individual characteristic.

Psychological climate's evolution was due to a need to understand the psychological processes that link cognitions of the organisational environment to affect and behaviour (James, et al., 1989). This approach's first emphasis was, therefore, to define the importance of identifying the distinguishing factors between climate as an individual characteristic (psychological climate) and climate as an organisational attribute (organisational climate) (Ekvall, 1987). James, et al., (1974) suggest that organisational climate is a 'catch-all' construct, corresponding to many other situational aspects of an organisational setting, for example, structure, context, and process (Schreuder, 1996). In their review of climate literature, James, et al., (1974) recommend that, "When regarded as an organisational attribute, the term organisational climate appears appropriate. When regarded as an individual attribute, it is recommended that a new designation such as 'psychological climate' be employed" (p.1108). Though criticism exists on the

concept of psychological climate, there is now a growing acceptance of this distinction (Ekvall, 1987; Alpass, 1994; Schneider, et. al., 1983).

So, is aggregation of psychological climate data from the individual level, to represent descriptions at the group, (or crew in this case), and organisational levels, a necessary step? There has been a heated debate ever since its introduction into the organisational behaviour field (Glick, 1985). Moussavi, Jones & Cronan (1990) have presented the main crux of the argument. They asked whether the similarity of psychological climate scores on different organisational or group levels is a compulsory pre-requisite for aggregate scores to be reliable measures of group and organisational climate.

Two corresponding sides of the debate exist. One side argues that individual perceptual consensus contributes to the predictive power of group climate and to organisational climate when measured by the mean perceptions of groups (James, Joyce & Slocum, 1988; cited in Alpass, 1994). Aggregation is seen as a higher level of analysis of individual data at an organisational and group level (Rousseau, 1985). The other side states that psychological climate, group and organisational level climate are completely different constructs (Glick, 1985).

Glick (1985) has suggested that aggregated scores can be seen as an invalid measure of group and organisational climate because with this approach, the random errors and biases introduced at the individual level, can be cancelled out. However, others have argued (e.g. Jones et al., 1979; Joyce & Slocum, 1984; etc.) that by measuring within-group (crew) and across-group (organisational) consensus principles is an empirically sound system "to establishing conclusiveness and consistency in substantive relationships of perceptual constructs" (Moussavi, et. al., 1990).

According to the developers of the model used in the present study, as long as psychometrically sound instruments are used at the individual level of analysis of

climate, the criteria of aggregation can only add to the forecasting capacity of organisational and group level climate.

3.3 Organisational and group climate

Litwin, et al. (1968) offer one of the most widely cited definitions of organisational climate. They viewed organisational climate as: "a set of measurable properties of the work environment, perceived directly or indirectly by the people who live and work in this environment, and assumed to influence their motivation and behaviour" (Litwin, et al., 1968, p. 1).

Group climate is a set of attributes which can be perceived about a group, team, division, department, and/or subsystem, and that may be induced from the way that the group deal with the environment and members (Field, et al., 1989; Hellriegel, et al., 1974). It is not unlike the organisational-level climate, in that, these levels of climate are perceptual and psychological in nature, and according to the present study, they both evolve from the smallest organisational/group unit, the individual employee.

Many studies have illustrated how climate perceptions have been in accordance with member's perceptions of an organisation. One such study by Drexler (1977) found that the climate of the organisation created groups that served the same purpose as different organisations. Offenberg and Cernius (1978; cited in Field, et. al., 1989) studied two school's responses to their Organisation Pattern Questionnaire. The organisational climate of both schools was already known by the researchers, but the members of each school were asked what they thought their organisational climate was. A large number of members were able to identify the particular climate of their school.

A exploratory analysis of construct validity of group climate by Howe (1977)

found that two criteria can be used to test for validity of both organisational climate and/or group climate. These two criteria are consensus of climate among group/organisation members, and indicative differences between perceived climate by two or more groups within an organisation (cited in Field, et. al., 1989). Howe (1977) also found that rather than personal attributes, or group by person-type effects, climate responses were a dominant function of the relative group memberships. Jones, et al., (1979) used similar criteria to those used by Howe (1977), in a study on U.S. Navy ships. Their study found that the different division structures of a ship each had its own group climate. The larger departments in ships and the crew as a whole however, had little homogeneity. Schneider and Snyder (1975) grouped respondents into position/role groups and found significant agreement on climate.

As above, there are many studies that build a picture of the differences in perceptions of climate in organisational groups (Astin, 1963; cited in Alpass, 1994; Curtis, 1975; Payne & Mansfield, 1973; Waters, Roach, & Batlis, 1974). Johnson (1976), for example, studied a small office firm and found two groups with significantly different climate perceptions, which were considered to be due to different socialisation processes of the groups. Hemphill and Westie (1950; cited in Alpass, 1994) used the Hemphill Group Dimension Description Questionnaire (1956) and found respondents expressed consensus on similar characteristics of climate within their respective groups.

Conclusions from the results of the many studies support the construct validity of organisational and group climate. Field, et al., (1989) stated that there is substantial evidence provided from previous research that different climates correlate with different groups within one organisation. It must therefore be noted that though organisational climate is a valid construct, one must understand that there are certain subclimates within each organisation. Schneider (1975) argued that "climates in which people function are composed of the many practices and procedures that occur in their situation". Therefore, because organisations have

many facets, each organisation has a number of climates.

3.4 Psychological climate measurement instruments

As psychological climate is the main focus of the present study, a theoretical and empirically supported instrument was needed. One of the best validated and psychometrically sound measures of psychological climate found was the Psychological Climate Questionnaire. Several long forms of the Psychological Climate Questionnaire have been developed (Jones, et al., 1979; Hornick, James & Jones, 1977; James, Hartman, Stebbins, & Jones, 1977). Originally developed by Jones, et al., (1979), the Psychological Climate Questionnaire contained 145 items that were represented by 35 composite variables formulated to measure four broad areas of organisations' work environments. These areas comprise perceptions of job or role related characteristics, leader oriented characteristics, measures of work group characteristics, and subsystem and organisational characteristics. Through previous research, items were chosen based on their demonstrated validity when illustrating the work environment (James & Hornick, 1973).

Relevant composites and/or short forms of the PC questionnaire have been developed from the long version of this instrument (i.e. Butler & Jones, 1979; James, Hater & Jones, 1981; James, et. al., 1980; Jones, James & Bruni, 1975; Jones, James, Bruni & Sells, 1975; the latter cited in Alpass, 1994). The short forms of this instrument were constructed by bringing together only highly correlated variables from the long versions of the PC questionnaire and disposing of items that diminished the internal consistency and composite homogeneity (James, et al., 1981). James, et al. (1990) and Butler and Ehrlich (1991) both found only four of the same components consistently used within different forms of the PC questionnaire. These factor domains are role stress and lack of harmony; job challenge and autonomy; leadership facilitation and support; and work group co-operation, friendliness and warmth (See Table 3.1). See also Table 3.2 for

definitions of each PC variable asterisked in Table 3.1.

Table 3.1 Psychological Climate (PC) composite variables by four factor domains (from James, James & Ashe, 1990).

Role Stress and Lack of Harmony	**Leader Facilitation and Support**
Role ambiguity*	Leader trust and support*
Role conflict*	Leader goal facilitation*
Role overload	Leader interaction facilitation*
Lack of organisational identification	Psychological influence
Lack of management concern and awareness	Hierarchical influence
	Work Group Co-operation, Friendliness and Warmth
Job Challenge and Autonomy	Workgroup co-operation*
Challenge and variety*	Workgroup friendliness and warmth*
Autonomy	Reputation for effectiveness
Job importance	Esprit de corps

* PC variables used in the present study

3.5 Psychological climate research

Research on psychological climate has remained largely within the boundaries of its relationships with job characteristics and job satisfaction (James, et al., 1980). Consequently, little *specific* empirical research has been conducted on the relationships between psychological climate and organisational outcomes such as turnover and accidents.

3.5.1 Work relationships

One such area of research that can be related to this study is interpersonal relationships within an organisation. A study by Richardsen, Burke and Leiter (1992; cited in Schreuder, 1996) of hospital employees in Norway found that interpersonal conflicts at work are the most common predictors of emotional exhaustion. Lack of support for subordinates, insufficient feedback, and members perceptions that their supervisors are 'out of touch' with their problems have been found to also increase emotional exhaustion (O'Driscoll & Schuber, 1988). This was the case in a New Zealand study. It was found that a lack of leader support

and trust within human service agencies was linked to emotional exhaustion (O'Driscoll, et. al., 1988). In particular, Riggar et al. (1987) found that these types of conflicts were associated with a high *turnover* rate of sports coaches in America. Guastello (1991; cited in Gibson, 1994) found, in a study of transit operators, that *injuries* became more frequent when they experienced such factors as stress and anxiety from those around them. Some of the PC variables to be researched in this study are associated with interpersonal relationships, compatibility of organisational members, and perceived organisational support. These PC variables are leader trust and support, work group co-operation, and work group friendliness and warmth (Schreuder, 1996).

Table 3.2 Description of the eight psychological climate variables used in the present study.

Variable	Definition
Role Ambiguity	Degree of perceived ambiguity in demands, criteria and interfaces with other jobs-tasks-roles.
Role Conflict	Degree to which role performance is seen as affected by pressures to engage in conflicting or mutually exclusive behaviours.
Job Challenge and Variety	Degree of perceived opportunity to make full use of abilities, skills, and knowledge: and the perceived range of tasks, equipment and behaviours involved in the job.
Leader Trust and Support	Degree to which leader is aware of and responsive to needs of subordinate and shows consideration for feelings of personal worth; and degree of confidence and trust in leader.
Leader Goal Facilitation	Degree to which leader is perceived as stimulating subordinate's involvement in meeting group goals.
Leader Interaction Facilitation	Degree to which leader is perceived as encouraging development of a close and cohesive work group.
Work group Co-operation	Degree of perceived co-operative effort among work members to carry out tasks.
Work group Friendliness and Warmth	Degree to which warm and friendly relations, trust and mutual liking among members are perceived.

From Jones and James (1979) and James and Sells (1981).

3.5.2 Role stress

Other organisational variables that have been studied extensively over the years are role conflict and role ambiguity. Rizzo, House, and Lirtzman (1970) stated that role ambiguity and conflict can result in stress thus causing poor performance, job dissatisfaction, and other adverse job behaviours. These adverse job behaviours and effects could be interpreted as *accidents and turnover*. Billingsley, et al. (1992) found that work-related variables, such as role conflict and role ambiguity, were good predictors of commitment and turnover. The PC variables used in this study that relate to these results are role conflict, role ambiguity, leader trust and support, work group co-operation, and work group friendliness and warmth.

3.5.3 Job challenge and variety

Another PC variable of concern in the present study is job challenge and variety. Researchers, such as Gerhart (1987), Baron and Greenberg (1989; cited in Schrueder, 1996), and Glisson and Durick (1988), have found that work that provides intrinsic rewards such as challenge, meaning, variety, and complexity are the most satisfying. Their studies illustrated that organisational members achieve job satisfaction with challenging work and work that keeps one busy. Work that also accommodates variety can influence high levels of job satisfaction, much more than dull, repetitious work (Curry, Wakefield, Price & Mueler, 1986; cited in Schrueder, 1996). A New Zealand study by Brook and Brook (1989) found that both professional and skilled trades people perceived more global satisfaction, for both work and non-work activities, from intrinsic rewards such as the chance to skills and abilities. As stated previously, high *turnover and accident rates* can be construed as the detrimental affects of job dissatisfaction. On the contrary, low turnover and accidents can be seen as the positive affects of job satisfaction. Therefore, if work carries high challenges and variety, the greater the satisfaction in one's job, the less likely one is to leave work, or have an accident.

3.5.4 Demographic factors

Mahoney (1977; cited in Jones, et al., 1979) noted that PC also reflects *individual characteristics* which are involved in the formation of perceptions and concepts. Many previous studies have provided support for this argument, thus illustrating that climate perceptions mirror the differences in such demographic variables as age, ethnicity, and gender (Hellriegel, et al., 1974).

3.5.5 Leadership factors

Blake and Mouton (1964), Indik (1968), Lewin (1951), Likert (1967), Litwin, et al. (1968), and McGregor (1960) regarded leadership as an important organisational factor that affects climate perceptions. Contemporary theoretical frameworks for climate clearly implicate leadership processes in the formation and maintenance of climate perceptions. More recent theoretical development, however, suggests a more unit-specific focus on leadership processes in contrast with an average organisational-level focus. Processes that characterise the interactions within the immediate organisational context are expected to have much closer links to perceptions (Indik, 1968; Schneider, 1983). Thus, the leadership behaviours of immediate supervisors are likely to be salient features and to be interpreted as representative of more molar organisational processes. It can therefore be assumed that the nature and quality of interactions with supervisors may be a key filter in the interpretations that help provide the basis for subordinates' climate perceptions.

Greiner, Leitch, and Barnes (1968; cited in Field, et. al., 1989) found the organisational climate within eight different government districts evolved through leader behaviour. They also found that the group climates depended on job functions and tasks. Meyer (1968; cited in Field, et al., 1989) found that different leadership styles contributed to different perceptions of organisational climate. Sheridan, Vredenburgh, and Abelson (1981; cited in Field, et. al., 1989) conducted a study with four head nurses in four different hospitals and studied their administration climate. They found that the organisational climate within each hospital was moderated by organisational conditions, such as leadership style.

3.6 Chapter summary

Chapter 3 outlined part of the new evolution model of climate. Psychological climates' role as the central focus of the present study was discussed, and was recognised as the unit of analysis for the present study. Moreover, the arguments surrounding aggregation of individual employee's perceptions for group and organisational level climate were presented. Theoretical and empirical support for each level of climate within the new evolution was discussed, thus illustrating the reasons for using this model. The instrument to be used for measuring PC perceptions in the present study was introduced.

Previous psychological research using work environment variables, corresponding with the PC variables in the present study, was presented. This research illustrated that the PC variables to be analysed in the present study have proven to significantly affect such work-related issues as accidents and turnover. The overall picture that emerges from literature is that, where employees are confronted with 'positive' aspects of PC (e.g.,. high levels of leader trust and support, low levels of role conflict), the negative effects of problems, like turnover and accidents, are reduced. On the other hand, in a work environment with high 'negative' aspects of PC (e.g.,. high role ambiguity, high role conflict, low work group co-operation), one would expect greater rates of problems, such as turnover and accidents (Schreuder, 1996).

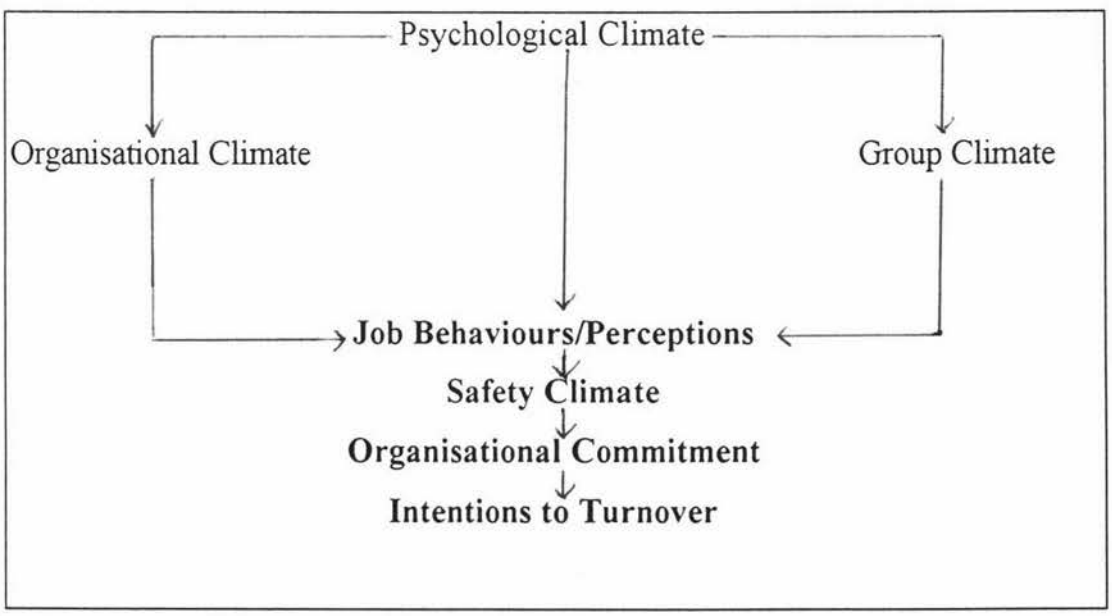
The next chapter will examine the job behaviours/perceptions influenced by climates in accordance with the model used in the present study. The present research focuses on three job behaviours/perceptions. These are; safety climate, organisational commitment, and intention to turnover. Chapter 4 will cover these variables, with special emphasis on the logging industry.

CHAPTER 4. SAFETY CLIMATE, COMMITMENT, AND INTENTION TO TURNOVER

4.1 Chapter overview

Figure 4.1 presents the role of safety climate, organisational commitment, and intention to turnover within the present study.

Figure 4.1 Model utilised in the present study.



As has been illustrated, job behaviours/perceptions can be influenced by Psychological Climate, but may not be influenced by organisational or group climate. Organisational and group climate occur when there is a consensus among organisational/group members. Since this consensus would rarely be absolute, the psychological climate of each ember would influence the group organisational/group climate perceptions to the extent of the consensus. It is thus

possible that the three types of climate (psychological, group, and organisational) would exist concurrently and have an integrated impact on job behaviours/perceptions.

This chapter will provide a brief overview of the concept of safety climate, chiefly because of its recent development. Safety climate research that is significant to the present study will be discussed and a background on the safety climate instrument to be used in the present study will be presented. Organisational commitment will be defined, as well as the measure used in this study. Intention to turnover will also be introduced and research related to the present study will be discussed.

4.2 Safety climate conceptualisation

Zohar (1980) conceptualised safety climate as organisational members' perceptions of safety within their workplace. Employees create a "coherent set of perceptions and expectations regarding behaviour-outcome contingencies and behave accordingly" (Zohar, 1980, p. 96). The construct's development originated from a need for explanations of the factors that are fundamental to safety, the lack of a definition of what makes up organisational safety, and a need for a relevant change agent specifically for safety measures (Williamson, et. al., 1997).

After reviewing previous literature on the concept, Zohar (1980), reported characteristics which determined differences between high and low accident rate organisations. In his final model which focused around an Israeli sample, Zohar (1980) defined these dimensions as: the importance of safety training; management attitudes towards safety; effects of safe conduct on promotion; level of risk at the workplace; effects of work pace on safety; status of the safety officer; effects of safe conduct on social status; and the status of the safety committee.

Brown and Holmes (1986), however, found through confirmatory factor analysis,

that these dimensions were not supported in samples from the U.S.A. They concluded that a three factor structure was more practical, in that it produced a picture of seemingly different safety perceptions between members who had had an accident, and members who had not. The three factors were employee perceptions of management concern about their well-being, management activity in responding to problems with employee well-being, and employee's perceptions of their own physical risk. The 3-factor model was subject to further testing by Dedobbeleer, et al. (1991). Their study on construction workers produced results that supported the model, but found more support in a two factor solution. These two factors were management commitment to safety and workers' involvement in safety.

Many more studies have been undertaken to determine the underpinnings of safety climate. These include Cox, et al. (1991), who studied industrial gas manufacturer's worker perceptions. They found five factors related to safety climate; (1) personal scepticism, (2) individual responsibility, (3) safeness of the work environment, (4) effectiveness of arrangements for safety, and (5) personal immunity. Donald, Cantaer, and Chalk (1991; cited in Williamson, et. al., 1997) developed a three factor model of safety attitudes. These three factors were found to be (1) people, or the organisational roles, that create the safety climate (for example, supervisor crewmembers), (2) attitude, behaviour, or facets of a member's safety behaviour (for example, knowledge, actual behaviour), and (3) type of safety behaviour or safety activity (for example, active behaviour, such as participating in safety meetings, or passive behaviour, such as wearing safety clothing). Seppala (1992; cited in Williamson, et al., 1997) also developed a three factor model of safety climate from research findings that identified organisational responsibility for safety, members' concern about safety, and members' indifference towards safety, as all contributing to an organisation's safety climate. A study on road workers by Niskanen (1994) concluded that workers and their supervisors had their own distinct four factor solutions for safety climate. However, each group included attitudes to safety in the organisation, changes in

work demands, and safety in productive work, as part of their perceptions of safety climate.

As can be seen from the previous discussions, safety climate research has not produced much agreement on the dimensions that should be included in its conceptualisation. Two facets from the research, however, have shown consistency as functions within a safety climate model. These are perceptions about management attitudes to safety, and workers' involvement in, or attitudes to safety. There is little consensus on the interpretation of these perceptions and the way they should be measured. Zohar (1980) and Brown, et al., (1986) had questioned workers about their perceptions of certain workplace safety situations. Dedobbeleer, et al. (1991) asked questions from a similar perspective, for example, "How important do you think the workers' safety practices are to the management of your company?". On the other hand, studies by Cox, et al. (1991) and Niskanen (1994) focused on using questions that addressed attitudes to safety in general. These included, "Accidents occur by chance" and "If I worried about safety, I would not get my job done".

Williamson, et al. (1997) have identified five factors that provide a combination of both general safety attitudes and the members' perceptions of workplace situations in an effort to come to a consensus on theoretical and empirical issues. They claim that the combination of these two perspectives allows a more holistic and valid measurement instrument of attitudes, perceptions and awareness of the safety climate within workplaces. This instrument will now be discussed.

4.2.1 Measuring safety climate

The five factors identified by Williamson, et al. (1997) are; (1) personal motivation for safe behaviour, (2) risk justification, (3) positive safety practice, (4) fatalism, and (5) optimism (see Table 4.1 for definitions). These variables have all been found to have significant validity when measuring safety climate.

Two versions (long and short) of Williamson, et al. (1997) safety climate questionnaire were developed using all five factors and both showed significant internal consistency. Each version was evolved on the basis of different needs. The long version was intended to depict workers' safety perceptions and attitudes so as to add to an organisation's safety climate and to allow diagnosis of respondent's own contributions. The short version is a summarised form of the items groups derived from the long version. The developers' main aim was to provide a short questionnaire in the case where responses may be affected by a lengthier questionnaire (for example, when respondents are participating during work hours).

Table 4.1 Five factor solution of safety climate.

Factor	Definition
Personal motivation for safety	Reflects the perceived deficiencies in the workplace that prevent respondents from working safely.
Risk justification	The circumstances in which unsafe behaviour actually occur.
Positive safety practice	Reflects perceptions of the workplace conditions, including the role and commitment of management to safety.
Fatalism	Reflects views of the importance and controllability of safety.
Optimism	Reflects the extent that the individual believes that their level of personal risk is favourable.

From Williamson, Feyer, Cairns, and Biancotti (1997).

The attitude and workplace perception scales were analysed to find the extent to which they show differences between individuals and their accident experiences and hazard perceptions. It was found that the scales could produce a valid assessment of individual safety attitudes and perceptions. However, no published study has been completed on the scales' performance in measuring the differences

between work groups, companies, or different workplaces with differing hazards.

Safety climate is a construct, which like other climates, is viewed as the sum of perceptions and attitudes of members within groups and organisations. Earlier studies have also found that there is utility in using safety climate scales as measures of individual accident experiences (Brown, et al., 1986; Donald, et al., 1991; the latter cited in Williamson, et al., 1997) and in different industries with differing hazards and/or accident rates (Zohar, 1980; Niskanen, 1994; Donald, et al., 1991; the latter cited in Williamson, et al., 1997).

4.2.2 Safety climate research summary

Research into the relationships between psychological climate and safety climate is non-existent, but as stated before, safety climate is a sub-climate within itself. It is therefore presumed that as a sub-climate, its perceptions derive from the individual perceptions, namely psychological climate. Several researchers, however, have discussed the effects that safety climate has on accidents within the workplace since Zohar's first studies (Dedobbeleer, et. al., 1991; Donald, et. al., 1994; Niskanen, 1994; Ostrom, et. al., 1993; Pidgeon, 1991; Weick, 1987).

One example is a study by Hofmann, Jacobs, and Landy (1995). They found that subordinates with supervisors who never mention the issue of safety, can develop perceptions of safety as being unimportant, thus ultimately, not attempting safe behaviour. On the other hand, organisational members have been found to take more responsibility towards personal safety through encouragement from a leader, in turn creating a positive safety climate (James, et. al., 1990; Schneider, 1983).

Literature shows that the role of management in creating norms and rules for safety practices is one of the most important components in developing an organisation's safety climate (see for example, Pidgeon, 1991; Dunbar, 1975; Zohar, 1980). Research by Griffiths (1985; cited in Gibson, 1994) found that there was a

reduction of *accident* related lost days per annum from 4000 days to 21 days because of top management's' commitment and efforts towards safety in several industrial gases companies. Dejoy (1990) stated that "the attitudes and actions of management shape the safety climate of the organisation and can influence the safety performance of the entire workforce" (p. 14). Dunbar (1975) found that the support supervisors show to subordinates significantly affects the way subordinates see safety responsibility (see also Zohar, 1980). Zohar deduced that "a genuine change in management attitudes and increased commitment are prerequisites for any successful attempt at improving the safety level in industrial organisations" (p. 101). Dejoy (1985) also concluded that "the safety attitudes of the first-line supervisor can have a significant positive or negative effect on the safety level of the work group" (p.14).

Implications of influences on safety climates have now started moving to top management, rather than stagnating at the supervisory level. Dejoy (1985) found that inferences made by top management about the reasons for safe behaviour can also have a major impact on an organisation's safety climate.

4.3 Organisational commitment

Much of the focus of research in the field of organisational behaviour has been on factors that affect the quality of organisational members' involvement, behaviour and performance. It has been identified through such research and theorising that organisational commitment is a very important work-related attitude (Robertson & Tang, 1995).

Organisational commitment is the second job behaviour/perception integrated into the present study. It has been defined most often as internalisation of an organisation's values and beliefs, effort in helping the organisation attain its goals, and a strong need to retain members within the organisation (Porter, Steers,

Monday & Boulian, 1974; cited in Luthans, et al., 1992). Cook, et al. (1980) referred to commitment as "a person's affective reactions to characteristics of his employing organisation" (p. 40). The construct of commitment can also be regarded as a organisational factor that adds or detracts from the subjective well-being of a members' work experience.

4.3.1 Organisational commitment research

The outcomes of commitment are fairly clear. Committed people are more likely to remain with the organisation and work toward organisational goals (Mowday, Porter, & Steers, 1982). Conversely, when commitment is low, intentions to quit are more likely (Mowday, et. al., 1982; Parasuraman, 1982), as well as are other exploration behaviours (Stumpf & Hartman, 1984). The organisational literature demonstrates that commitment is significantly and negatively associated with turnover and, to a lesser extent, other withdrawal behaviours such as decreased performance and increased absenteeism (Reichers, 1985). Alternatively, increased commitment may lead to greater job effort (Mowday, et. al., 1982; Rosenhotz, 1989; cited in Mowday, et. al., 1982).

A number of researchers have investigated the relationship between role related factors and commitment (Mowday, et. al., 1982). Stevens, Beyer, and Trice (1978) found that role overload was strongly and inversely related to employee commitment (Mowday et. al., 1982). Role conflict has also been found to be inversely related to commitment; however, the relationship between role ambiguity and commitment is less clear (Morris & Koch, 1979; Morris & Sherman, 1981). Role ambiguity refers to the lack of necessary information available to a given position, while role conflict results when inconsistent behaviours are expected from an individual (Rizzo, et al., 1970). Mowday et. al. (1982) suggested that the impact of role related factors on commitment may be positive when the employee has clear and challenging job assignments. However, when assignments become ambiguous, place the employee in conflict, or provide excessive role stress, the

effects on commitment will be adverse.

A relationship between commitment and leadership style has been reported in the organisational and management literature. Commitment was found to be related to leader initiating structure (Brief, Aldag, & Wallden, 1976). Other researchers reported a positive relationship between leader consideration or support and commitment (Michaels & Spector, 1982; Morris, et al., 1981; Parasuraman, et al., 1987).

Stress among employees has been documented in numerous studies and is believed to be a contributor to attrition (for example, Billingsley & Cross, 1991; Billingsley, et. al., 1992). Levels of stress have also been linked to organisational commitment (Hrebiniak & Alutto, 1972; Parasuraman, et al., 1987). Parasuraman, et al., (1987) theorised that stress undercuts commitment and generates strong thoughts about quitting.

It can be seen that those variables thought to be predictors of commitment are those that are contained within the Psychological Climate questionnaire. However, the relationship of commitment and how PC affects it has received little attention. Recommendations by Wood (1994), however, state that an organisation must manage their climate to allow for greater employee retention. The article contends that many organisations spend their resources on physical factors, but not on the psychological climate, which, when positive, makes an organisation pleasant to work for.

One study that has researched PC and its influence on commitment was by Luthans, et al. (1992). Though this study used different measures from the present research, its focus was on the importance of social support climate on employee commitment within 19 banks. The social support climate was measured by Litwin, et al.'s (1968) quantitative Organisational Climate Questionnaire and included four scales viewed as being closely related to social support: warmth, support, identity,

and conflict. The quantitative organisational commitment scale (Allen & Meyer, 1990) was implemented to measure the commitment within the banks and used three scales: affective commitment – employees' emotional attachment to an organisation or "cohesion commitment"; normative commitment - feelings of obligation to stay with their organisation; and continuance commitment - commitment to an organisation because of lack of job alternatives or the sacrifices involved in leaving. The study also included a qualitative method of analysis, of which nine items were used to ask the respondents to report their feelings, perceptions, and comments related to the supportive organisational climate and commitment in their organisations.

The qualitative results were generally supported by the quantitative analysis. The results illustrated that bank tellers felt that to be committed, there should be a warm and supportive climate. It was also found that bank tellers in a warm and supportive climate were relatively more committed than other tellers. However, some did feel that they "should *be* committed", rather than actually feeling commitment. A consensus of results revealed a supportive climate as a "caring, 'laid-back' atmosphere" (Luthans, et al., 1992). Respondents felt they could easily identify with this climate and feel higher levels of commitment towards an organisation.

Further studies into organisational commitment, though not directly researching climate, also found similar results when related to 'social support' climate. Cook, et al. (1980) found that trust and its sub-scale in the study of faith in management correlated substantially with organisational commitment. Hrebiniak, et al. (1972) also found that trust correlated with commitment.

4.3.2 Measuring organisational commitment

One of the most widely used organisational commitment measurement scales was developed by Porter (see Mowday, et al., 1979). Its original design was developed

to measure American employees' perceptions of commitment. However, the specificity in the sample group creates problems when trying to relate the phrases used in the original instrument to different populations. Others have also developed their own versions for measuring organisational commitment (for example, Brown, et al., 1969; Hall, Schneider & Nygren, 1970; Patchen, 1970; Lee, 1971; Sheldon, 1971; all cited in Cook, et al., 1980; Hrebiniak, et al., 1972). Such scales, as with Porter's (see Mowday , 1979), proved inadequate when applied to non-specific populations. Little or no psychometric support has been provided for any of these scales, neither from test-retest analysis, nor from factor analysis. Commitment measures seem to have made no allowances for different cultural standardisation, and appear to provide, what Cook, et al. (1980) describe as, only an "ad hoc nature of measures" (p. 41). It was on this basis that Cook, et al. (1980) developed a measure of organisational commitment that can equip researchers with a more general and non-specific scale to allow application with many populations.

Cook, et al. (1980) extended a theory on the development of organisational commitment originally presented by Buchanan (1974). Buchanan (1974) differentiated three components that made up organisational commitment, that is, (1) identification, (2) involvement, and (3) loyalty. *Identification* represents the pride one has in the organisation and the internalisation of the organisation's goals and values. *Involvement* is the psychological absorption in the activities of one's roles, and *Loyalty* embodies the affection and attachment towards the organisation and the sense of belongingness that materialises into 'a wish to stay'.

Cook, et al. (1980) decided that their measure would use the three component distinctions suggested by Buchanan (1974), and his definitions for 'identification' and 'loyalty'. Changes to the 'involvement' component took into account arguments on whether or not the focus should be on the employee working industriously, for their own satisfaction (Lodahl & Kejner, 1965; Hackman & Oldham, 1976), or for the organisation to which they belong (Mowday, et al.,

1979). The definition thus became the "willingness to invest personal effort as a member of the organisation, for the sake of the organisation" (p. 41). This scale has been proven through factor analysis, correlational analysis and test-retests, as being psychometrically adequate, stable and reliable (see Chapter 5 for details).

When inspecting the past literature and research on organisational commitment, commitment and intentions have been identified as a critical factor in terminating employment (Blair, 1989; cited in Schreuder, 1996; Mowday, et. al., 1979; Shore, Thornton, & Newton, 1989). Conceptual models and related research suggest that commitment and intentions are complementary attitudinal components of individuals' decisions to leave a job. This is the rationale for the inclusion of intention to turnover in the present study.

4.4 Intention to turnover

Baron, et al. (1989; cited in Schreuder, 1996) stated that there are many factors that relate to an individual, their jobs and their economic conditions that contribute to a desire to leave a job or vocation and move to another. The concept itself can be referred to as an individuals' perception of the probability of staying in an organisation or terminating employment, or in other words, the behavioural intentions of staying or leaving a role.

Parasuraman (1982) found that behavioural intentions are most likely to provide the most proximate predictor of actual turnover. It appeared through the results that the major impetus to voluntary job termination derived from psychological *stress* and individuals' instrumental evaluations of the organisation, translated into behavioural intentions.

Other studies have found that intentions to turnover, and consequently, turnover, are created by many other factors. Marini, et al., (1992; cited in Schreuder, 1996)

studied sports coaches in the United States to find why the occupation has the highest turnover rates of any occupation in the country. They found that there were twelve categories of reasons why these coaches had intended to quit. The concluding twelve groupings of reasons were as follows: lack of recognition/rewards; lack of control over negative attitudes; low salaries; lack of appropriate training; dealing with the uncertainty of placement problems/crises; *isolation from co-workers*; lack of consumer commitment; *stress of filling quotas*; *ambiguity* of follow-along services; and environmental barriers to client's successful habitation.

Supervisors/management have been found to have quite different perspectives on why personnel leave their job to the individuals themselves who left their jobs (Riggar, et al., 1987). Riggar et al's study of rehabilitation professionals found that even though there was disparity in perceptions, supervisors had immediate control over three of the four reasons why the rehabilitation professionals left. The four reasons were noted as: little advancement potential; little job satisfaction; *stress and/or burnout; and personality clashes with supervisors/management.* Little advancement potential was the only reason cited by the study as the one that over which management had limited control.

The previous paragraphs illustrate empirical support for intention to turnover being a excellent predictor of the actual behaviour of quitting. They also demonstrate that the psychological variables used in the present study have established links to turnover within organisations.

4.5 Chapter summary

Chapter 4 has discussed the three job behaviours/perceptions under scrutiny in the present study. Their place within the model was explained and previous research into each variable was introduced. Their relationships with both psychological

climate and the adverse activities was also discussed and justified. Moreover, the instruments to be used in the present study for measuring the safety climate and commitment of the subjects were introduced. Chapter 5 will present and describe the current model and the research goals.

CHAPTER 5. MODEL AND OBJECTIVES

5.1 Chapter overview

The previous four chapters have illustrated the arguments supporting the basic premises of the model used in the present study. This chapter will now introduce the full model to be used in the present study, together with the adaptations made in the original Field, et al., (1982) model (see Figure 5.1). The research goals will also be presented.

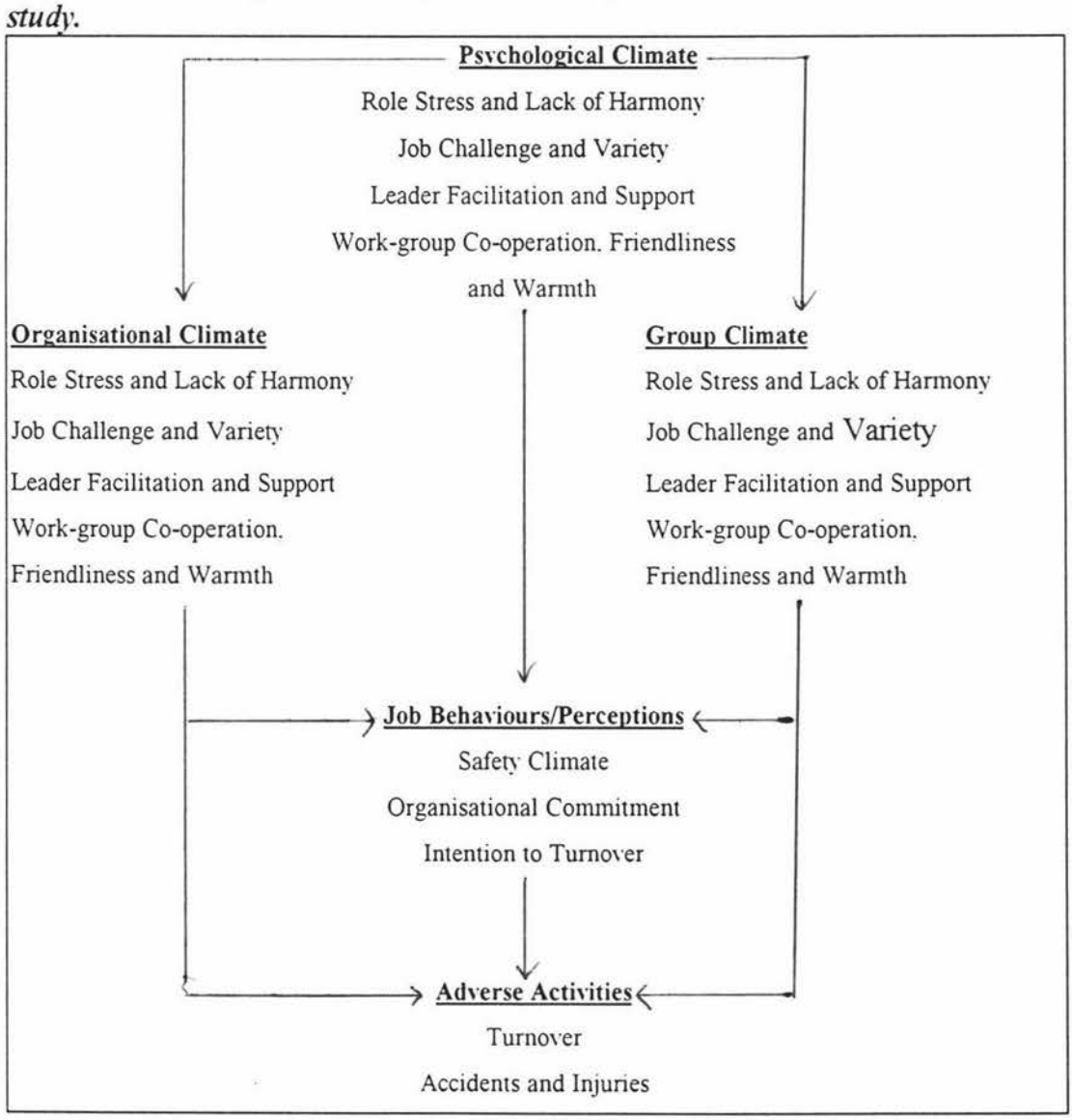
5.2 Model used in present study

As has been discussed previously, the present study utilises a revised model by Field et al., (1982), based on the original model developed by James et al., (1974). Further changes have been made to the reconceptualised model in order to adapt it to the present study. First, and foremost, only a part of Field's et al., 'new evolution' model has been used. The reason for including only a section of the model is because of the small size of the current study, and the lack of relevance of certain variables in the Field et al, (1982) model.

The PC variables and items originally used have been replaced with the PC variables employed within the present study. The safety climate, organisational commitment, and intention to turnover variables have been employed as job behaviours/perceptions. The revised model illustrated such behaviours and perceptions as motivation and performance. However, because of the specific problems to be studied in the present study, these three variables were thought to be more appropriate.

Because of the lack of previous research on psychological processes within the logging industry, this study is primarily exploratory. Several research questions will be posed to explore aspects of the proposed model. Firstly, the psychological climate as perceived by different crews, types of crews, and crewmembers and contractors will be examined. Secondly, the PC predictor variables will be tested for their relationship with the job behaviour/perception variables and the adverse activity variables (accidents and turnover), and the job behaviours/perceptions relationships with the adverse activities will be examined.

Figure 5.1 Diagrammatic representation of the model used in the current study.



5.3 Study objectives

More specifically, the research questions for the present study are:

Question One

Are there differences between crews, crew types, and statuses (crewmembers and contractors) in their perceptions of psychological climate?

Psychological climate is the focal point of the present study. The model presents climate as a perceptual phenomenon, taking the place of organisational climate as the main focus. Group climate (or crew climate in this case) was added to the revised model, which has a similar role to organisational climate. Group and organisational climate occur only when there is a consensus of climate perceptions by unit members, though, as stated before, these climates may not occur due to differing individual views within their appropriate units.

Recent theoretical development also suggests that a more unit-specific focus on leadership processes is needed. Leadership, or contractors in the present study's case, was thought to be the key filter in the interpretations that help provide the basis for subordinates' climate perceptions (Indik, 1968; Schneider, 1983).

Question Two

What are the relationships between psychological climate variables and job behaviours/perceptions such as safety climate, organisational commitment, and intentions to turnover?

Research has confirmed that PC can have strong influences on organisational behaviours and perceptions (Forehand, et al., 1964; Kaczka, et al., 1968; Lawler, et al., 1974; Lewin, et al., 1939; Litwin, et al., 1968; Waters, et al., 1974;

Pritchard, et al., 1973; cited in Field, et al., 1982).

No studies were found on the relationships between psychological climate and safety climate. However, researchers have found that psychological climate (and those variables similar to the PC variables used in the present study) does affect organisational commitment (Billingsley, et al., 1992; Cook, et al., 1980; Luthans, et al., 1992). Perceptions of the work environment (those similar to the PC variables used in the present study) do affect intentions to turnover (for example; Marini, et. al, 1992; Moore, et al., 1991; both cited in Schreuder, 1996). Specifically, Marini, et al. (1992; cited in Schreuder, 1996), Parasuraman (1982) and Riggar, et al. (1987) linked role stress negatively with intentions of leaving.

Question Three

What are the relationships between psychological climate variables and adverse activities such as turnover and accidents?

Interpersonal relationships are said to be associated with turnover (Riggar, et. al., 1987) and injuries (O'Driscoll, et. al., 1988). Leader facilitation and support have been cited as having influence on turnover (Lewin, et. al., 1939) and accidents (Griffiths, 1985; cited in Gibson, 1994; Lewin, et. al., 1939). Role ambiguity and role conflict have also been related to adverse effects like turnover and accidents (Rizzo, et al., 1970; Newton, et al., 1987, cited in Schreuder, 1996). Lastly, job challenge and variety has been inadvertently linked with such adverse effects of job dissatisfaction as turnover and accidents (Curry, et al., 1986; cited in Schreuder, 1996).

Question Four

What are the relationships between job behaviours/perceptions and adverse activities such as turnover and accidents?

Safety climate has been recognised as having significant effects on accidents (Hofmann, et. al., 1996; James, et. al., 1990; Schneider, 1983; Zohar, 1980; Dejoy, 1985; and Griffiths, 1985; cited in Gibson, 1994).

Commitment and intention to turnover have been found to effect such organisational adversities as turnover rates (Luthans, et. al., 1992; Cook, et. al., 1980, and Alutto, 1972; cited in Schreuder, 1996).

The following chapter describes the methodology used in the present study.

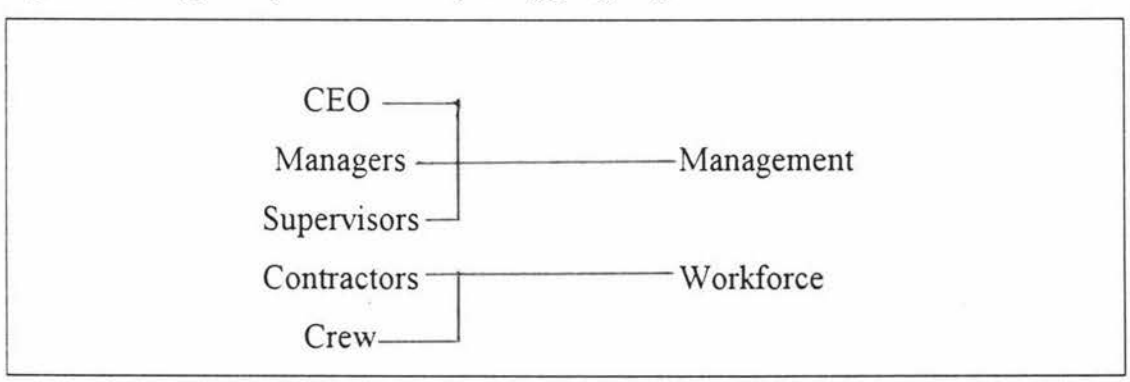
CHAPTER 6. METHODOLOGY

6.1 Design

Data was collected by a cross-sectional survey method using a questionnaire developed specifically for the purpose of the study. The instruments used in the present study were collated together from prior organisational and occupational literature. This literature was sourced from LIRO's private library and the cd-rom databases ABI/INFORM and PSYCH LIT.

The following diagram (Figure 6.1) illustrates the organisational structure of a company within the logging industry. As only the logging workforce was available for participation, no higher-level management personnel were included in the study. However, to obtain an overall picture of the climates within the logging industry, the contractors' version of the questionnaire focused on their relationships with management, while the crewmember's version concentrated on workforce relationships.

Figure 6.1 Typical framework of a logging organisation.



A change to the wording of some instruments was necessary to accommodate reading levels, time constraints, and terminology used in the logging industry. Instruments were developed that were suitable for the blue collar work force.

Rotter (1975; cited in Gibson, 1994) and Lefcourt (1992) note that changes to scales are necessary to provide valid measurement in specific populations. Wording, such as 'leader', was therefore changed to 'supervisor' (depending on whether the questionnaire was directed at a crewmember or contractor, respectively) and from 'work group' to 'crew'.

All questions were set up on a 5-point Likert scale. The Likert scale allows one to achieve the same validity as more time consuming methods (for example, Thurstone's scales), but is ideal for situations with time limits. Each question presented a statement, followed by the 5-point Likert scale with scale anchors (for example, strongly agree to strongly disagree). Only the sample characteristic questions were presented without the Likert scale.

Reversals of scale anchors were used in accordance with the recommendations made by the original authors of the four measures (that is, the psychological climate instrument, the safety climate instrument, the organisational commitment instrument, and the intentions to turnover instrument). This was done to reduce response set bias and to avoid leading the respondents into making particular responses.

6.1.1 Pilot testing

To ensure the requirements and objectives of the study could be met by the questionnaire, a pilot test was conducted on one crew not included in the main study. Questions and their layout, and interpretability of questions by the respondents, needed to be checked before the main data collection commenced.

Before the pilot test, each question was examined for its relevance to the logging industry, by a supervisor and a LIRO representative. During the pilot testing the respondents were asked to comment on questions that they found difficult or questions they found to be inappropriate for their job and environment. Three

questions were dropped from the questionnaire because they were considered to be irrelevant. Each of the questions that were deleted from the questionnaire was from different psychological climate composite variables. This ensured that the validity was not completely compromised.

Other questions and scale anchors were reworded to allow for better understanding. Most of these changes were made because the respondents had difficulty with the wording of negative statements. Questions were, therefore, changed to positive statements and scale anchors were adjusted accordingly.

Since the pilot test revealed that the time taken to complete the questionnaire was excessive, the length of the questionnaire was subsequently shortened. Because of the limited time available on work sites, the short version of the safety climate questionnaire was utilised. The questions in the short version were contained within the longer version, thus eliminating the necessity for further pilot testing.

Preliminary results were tabulated and sent to the pilot testing crew. No further analysis of results was presented because of the minimal size of the sample, but a contact phone number was sent with the results to allow participants to ask further questions. The final questionnaires for both the contractor and the crewmembers appear in Appendix 1.

6.2 Sample

The crews used in this study were located through their respective contracting organisations (6 crews; 73 subjects; 67 crewmembers; 6 contractors). All individual contractors were contacted by phone with an invitation for themselves and their crew to participate in the study. All contractors asked to participate nominated their crews as potential respondents, of which all accepted to participate. Two companies were selected on the basis of providing two different

crew types; corporate crews and woodlot crews. Corporate crews are based in large forests, with long-term contracts. Woodlot crews are based in small forests, usually located on farms, with usually short-term contracts. Fletcher Challenge (Rotorua area) and Carter Holt Harvey Forests Ltd (Hawkes Bay area) provided the respective crew types.

6.3 Sample characteristics

For the purposes of the characteristic results, the sample is subdivided into two types of crews (corporate crews and woodlot crews) and is further subdivided into the six separate crews (corporate crews 1, 2, 3, 4, and woodlot crews 1 and 2). The results also refer to two types of subject statuses (contractors and crewmembers). This distinction between contractors (n=6) and crewmembers (n=67) was to allow for interpretation of the links between leaders and subordinates, and as explained earlier, for a more holistic perspective of the logging industry.

6.3.1 Contractors characteristics

The following results illustrate details of the contractors' demographic data. The crewmembers' information will be reviewed in Section 6.3.2.

Results indicated that of the 6 contractors surveyed, 4 were corporate contractors (66.67%) and 2 were woodlot contractors (33.33%). One hundred percent of contractor respondents were male, and had varying numbers of years in high school, years within the logging industry, and years in charge of their respective crews. The contractors had also worked for varying numbers of crews. The results on the ethnicity of the contractor respondents were, however, of particular interest (see Table 6.1).

Table 6.1 Ethnicity of each contractor.

RACE	CORP. CONTRACTORS	WDLOT. CONTRACTORS	TOTAL
N.Z. EUROPEAN	**2 (50.00)**	**2 (100.00)**	4(66.67)
N.Z. MAORI	**1 (25.00)**	0 (0.00)	1(16.67)
OTHER	**1 (25.00)**	0 (0.00)	1(16.67)
TOTAL	4	2	6

Note. ( ) indicates percentages

Table 6.1 shows that the majority of contractors were New Zealand Europeans (66.67%). Only one contractor was New Zealand Maori, and one contractor classed himself as 'other'. Both the Woodlot contractors were New Zealand European's.

Table 6.2 The age of contractors by crew type.

Age	Corporate Contractors	Woodlot Contractors	TOTAL
35 to 39 years old	2 (50.00)	1 (50.00)	3 (50.00)
40 to 44 years old	0 (0.00)	1 (50.00)	1 (16.67)
45 to 50 years old	2 (50.00)	0 (0.00)	2 (33.33)

The ages of the contractors were also of interest (Table 6.2). The ages ranged from 35 to 50 years old. Half of the corporate contractors were aged 35 to 39, and half from 45 to 50. Woodlot contractors were slightly younger as 50.00% were 35 to 39, and 50.00% were aged from 40 to 44.

6.3.2 Crewmember characteristics

6.3.2.1 Age of crewmembers

Analysis of the crewmembers' demographic information indicated that the age range of the sample (n=64, missing values = 3) was 15 to 55 years.

As can be seen in Table 6.3, each crew had varying characteristics. Half of corporate crew 1 were in the age group of 30-34 years old, while corporate crew 2 had a higher percentage of their members within the age group of 20-24 years old. Corporate crew 2 also has a relatively large proportion of their members within the 40-44 and 45-49 age groups. The majority of corporate crew 3 members were in the lower age groups (15-19 and 20-24), with 37% being in the 15-19 age group. Two of corporate crew 3 members were in the oldest age group of 50-54. Corporate crew 4 members were concentrated in the 20-24 age group and the 35-39 age group. Woodlot crew 1 had the majority of members within the 20-24 years old age group (66.67%), while woodlot crew 2 had a large proportion of their member's within the 40-44 age group.

Table 6.3 Number and percentages of crewmembers in each age group.

AGE	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	Tot.
15-19	0 (0.00)	0 (0.00)	10 (37.04)	1 (12.50)	0 (0.00)	0 (0.00)	11 (20.37)
20-24	2 (20.00)	4 (36.36)	6 (22.22)	3 (37.50)	2 (66.67)	0 (0.00)	17 (31.48)
25-29	2 (20.00)	3 (27.27)	3 (11.11)	0 (0.00)	0 (0.00)	1 (20.00)	9 (16.67)
30-34	5 (50.00)	0 (0.00)	2 (7.41)	0 (0.00)	0 (0.00)	1 (20.00)	8 (14.81)
35-39	0 (0.00)	0 (0).00	2 (7.41)	3 (37.50)	1 (33.33)	0 (0.00)	6 (11.11)
40-44	0 (0.00)	2 (18.18)	2 (7.41)	1 (12.50)	0 (0).00	2 (40.00)	7 (12.96)
45-49	1 (10.00)	2 (18.18)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (5.56)
50-55	0 (0.00)	0 (0.00)	2 (7.41)	0(0.00)	0 (0.00)	1 (20.00)	3 (5.56)
Tot.	10	11	27	8	3	5	64

Note. ( ) indicate percentages.
Missing values = 3.

Overall, there were few similarities in the age distribution of different types of crews. Woodlot crew 1 had much younger members than woodlot crew 2, and the corporate crews characteristics varied, as well. Corporate crews 2, 3, 4, and woodlot crew 1 had a high percentage of their members in the lower age groups,

and corporate crew 2 and woodlot crew 2 had high percentages of members in the higher age groups.

6.3.2.2 Gender of crewmembers

Analysis of the crewmembers' demographic information show that the sample (n=67) consisted of 61 males (91.04%) and 6 females (8.96%), with all individuals answering this item. The results shown in Table 6.4 illustrates that only corporate crew 2 and corporate crew 3 had female crewmembers, with corporate crew 3 having a surprisingly high (18.52%) proportion of females. No woodlot crews had any female members.

Table 6.4 Gender distribution within crews.

SEX	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	TOT.
MALE	10 (100)	11 (91.67)	22 (81.48)	10 (100)	3 (100.00)	5 (100.00)	**61 (91.04)**
FEML.	0 (0.00)	**1 (8.33)**	**5 (18.52)**	0 (0.00)	0 (0.00)	0 (0.00)	**6 (8.96)**
TOT.	10	12	27	10	3	5	67

Note. ( ) indicates percentages.

6.3.2.3 Ethnicity of crewmembers

Table 6.5 illustrates the variation of ethnicity within crews. The majority of crewmembers were New Zealand Maori (61.12%), while 34.33% were New Zealand European, and 4.48% classed themselves as 'other'. The corporate crews tended to have a majority of New Zealand Maori members, with the exception of corporate crew 1. Woodlot crew 1 had a majority of New Zealand European members, while woodlot crew 2 had a majority of New Zealand Maori members.

Table 6.5 Crewmember ethnicity by each crew.

RACE	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	TOT.
NZ Euro.	**6 (60.00)**	3 (25.00)	8 (29.63)	2 (20.00)	**3 (100.00)**	1 (20.00)	23 (34.33)
NZ Maori	4 (40.00)	**9 (75.00)**	**18 (66.67)**	**6 (60.00)**	0 (0.00)	**4 (80.00)**	**41 (61.19)**
Other	0 (0.00)	0 (0.00)	1 (3.70)	2 (20.00)	0 (0.00)	0 (0.00)	3 (4.48)
Tot.	10	12	27	10	3	5	67

Note. ( ) indicates percentages.

6.3.2.4 Crewmember's high school education

There were variations in the length of time in high school education within each crew and type of crew. These results can be seen in Table 6.6.

Table 6.6 Crewmember's years at high school.

YEARS AT HIGH SCH.	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	TOT.
1YEAR	0 (0.00)	1(8.33)	1 (3.70)	1 (10.00)	0 (0.00)	0 (0.00)	3 (4.69)
2 YEARS	2 (20.00)	0 (0.00)	3 (11.11)	0 (0.00)	0 (0.00)	1 (20.00)	6 (9.38)
3 YEARS	2 (20.00)	5 (41.67)	11 (40.74)	**8 (80.00)**	0 (0.00)	2 (40.00)	**28 (43.75)**
4 YEARS	2 (20.00)	1 (8.33)	9 (33.33)	0 (0.00)	**3 (100.00)**	1 (20.00)	16 (25.00)
5 YEARS	3 (30.00)	5 (41.67)	2 (7.41)	0 (0.00)	0 (0.00)	0 (0.00)	11 (17.19)
TOT.	9	12	26	9	3	5	64

Note. ( ) indicate percentages
Missing Values = 3

Many of the respondents in the present study had spent 3 years at high school (43.75%). Twenty five percent had spent four years at high school, 17.19% were at high school for five years, 9.38% for two years, and 4.69% spent one year at high school. Each crew had a range of members with different levels of high

school education apart from woodlot crew 1. In woodlot crew 1, all three members had spent 4 years in high school. Corporate crew 4 also demonstrated less variation as 80.00% of their members had completed 3 years at high school. The only consistent pattern to emerge is that the majority of the sample had spent at least three years in high school. Only 14.06% of the crewmembers had spent less than three years in high school, while 85.94% had completed three years and over.

6.3.2.5 Crewmember's length of time within the present crew

Results of the participants' length of time with their crew indicate that most members had not been employed for long periods with their respective crews (see Table 6.7).

Table 6.7 shows that the many participants had been working in their present crews for between 1 week and 11 months (35.82%), and 1 to 5 years (46.27%). Very few members of the sample had been working for 5 years and over (17.91%). Corporate crews 1, 2, and 4, and woodlot crew 1 had employed the majority of their members for 1 to 5 years. Corporate crew 3 had employed the majority of its members for only 1 to 11 months. Only corporate crew 2 have employees who have been with their crew for longer than 16 years. Corporate crew 1 and woodlot crew 1 both had members that had *only* been in the present crew for up to 5 years. Corporate crew 2 was the only crew to have crewmembers dispersed throughout the time groupings, while woodlot crew 2 was the only woodlot crew that had a member who had been employed in the present crew for over five years.

Obviously both crew types have many employees that are very new to their crews. The pattern of results also show that the present sample is made up of many new trainees, as well as those who have been with the crew for a number of years, but very few had been employed for over five years.

Table 6.7 Length of time with crew.

LENGTH OF TIME	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	TOT.
1 MTH-11 MTHS	**3 (30.00)**	2 (16.67)	**14 (51.85)**	2 (20.00)	1 (33.33)	**2 (40.00)**	**24 (35.82)**
1-5 YEARS	**7 (70.00)**	**5 (41.67)**	8 (29.63)	**7 (70.00)**	**2 (66.67)**	**2 (40.00)**	**31 (46.27)**
6-10 YEARS	0 (0.00)	2 (16.67)	5 (18.52)	1 (10.00)	0 (0.00)	0 (0.00)	8 (11.94)
11-15 YEARS	0 (0.00)	1 (8.33)	0 (0.00)	0 (0.00)	0 (0.00)	1 (20.00)	2 (2.99)
16-20 YEARS	0 (0.00)	1 (8.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.49)
21-25 YEARS	0 (0.00)	1 (8.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.49)
TOT.	10	12	27	10	3	5	67

Note. ( ) indicates percentages

6.3.2.6 Crewmember's length of time within the logging industry

The results illustrating the length of time employed within the logging industry present similar pictures to the above. Crewmembers were found to have had very short tenures within the logging industry (see Table 6.8).

The 'years with the logging industry' variable shows that many of the crewmembers had spent only one to five years (32.84%) working in the logging industry. Twenty-two percent had worked for six to ten years and 20.90% had worked for 1 week to 11 months (trainees). These results show that the majority of respondents (76.12%) had worked from between 1 week and five years in the logging industry.

Half of corporate crew 1 members (50.00%) and 40.00% of corporate crew 4 members had worked in the logging industry for 1 to 5 years. Many of corporate crew 2 members, on the other hand, had worked for 6 to 10 years (33.33%), and

37.04% of corporate crew 3 members had worked for only 1 month to 11 months within the logging industry. The majority of woodlot crew 1 members had worked for 1 to 5 years (66.67%) and many of woodlot crew 2's members had worked for 6 to 10 years (40.00%).

Table 6.8 Crewmember's years within the logging industry (n=67).

YEARS IN LOG. INDUST.	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	Tot.
1MTH-11MTHS	2 (20.00)	1 (8.33)	**10 (37.04)**	1 (10.00)	0 (0.00)	0 (0.00)	14 (20.90)
1-5 YEARS	**5 (50.00)**	3 (25.00)	7 (25.93)	**4 (40.00)**	**2 (66.67)**	1 (20.00)	**22 (32.84)**
6-10 YEARS	2 (20.00)	**4 (33.33)**	4 (14.81)	2 (20.00)	1 (33.33)	**2 (40.00)**	15 (22.39)
11-15 YEARS	0 (0.00)	1 (8.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.49)
16-20 YEARS	0 (0.00)	1 (8.33)	3 (11.11)	2 (20.00)	0 (0.00)	1 (20.00)	7 (10.45)
21-25 YEARS	1 (10.00)	2 (16.67)	2 (7.41)	1 (10.00)	0 (0.00)	1 (20.00)	7 (10.45)
26-30 YEARS	0 (0.00)	0 (0.00)	1 (3.70)	0 (0.00)	0(0.00)	0 (0.00)	1 (1.49)
TOT.	10	12	27	10	3	5	67

Note. ( ) indicates percentages

The only consistent pattern between and within crew types was that most of the members had not been employed in the logging industry for a long period. All crews, however, apart from woodlot crew 1, had some members who had spent over 10 years in the logging industry. Both these statements resemble the previous results (length of time in crew).

6.3.2.7 Number of crews worked for by each crewmember

The results indicated that the respondents in the present study had worked for relatively few crews during their tenure with the logging industry (see Table 6.9). The numbers highlighted in Table 6.9 show that corporate crews 2, 3, 4 and woodlot crew 1, all had a majority of members who had worked for only 1 to 2

crews. Corporate crew 1 and woodlot crew 2 both had a majority of crewmembers whom had worked for 3 to 5 crews. The total number of members for each grouping illustrates that most of the participants within the present study had worked for 1 to 2 crews (54.55%) while 36.36% had been employed by 3 to 5 crews. Four and a half percent had worked for 6 to 8 and 9 to 11 crews. One woodlot crew, that is, number 2, had two members who have worked for 6 to 8 crews, while corporate crew 2 had one members who had worked for 6 to 8 crews. Corporate crews 3 and 4 have one and two members, respectively, who had worked for 9-11 crews.

Table 6.9 Number of crews worked for by crew (n=66).

NO. OF CREWS	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2	Tot.
1-2	3 (30.00)	**6 (50.00)**	**19 (70.37)**	**6 (60.00)**	**2 (66.67)**	0 (0.00)	**36 (54.55)**
3-5	**6 (60.00)**	5 (41.67)	7 (25.93)	2 (20.00)	1 (33.33)	**3 (60.00)**	**24 (36.36)**
6-8	0 (0.00)	1 (8.33)	0 (0.00)	0 (0.00)	0 (0.00)	2 (40.00)	3 (4.55)
9-11	0 (0.00)	0 (0.00)	1 (3.70)	2 (20.00)	0 (0.00)	0 (0.00)	3 (4.55)
Tot.	9	12	27	10	3	5	66

Note. ( ) indicates percentages
Missing Values = 1

It can be seen from Table 6.9 that the corporate crews had a few members who have moved from crew to crew many times. Overall, the majority have been employed by relatively few crews. However, this could be explained by the fact that many of the present sample population were made up of either trainees or those who had not been in the logging industry for a long period of time.

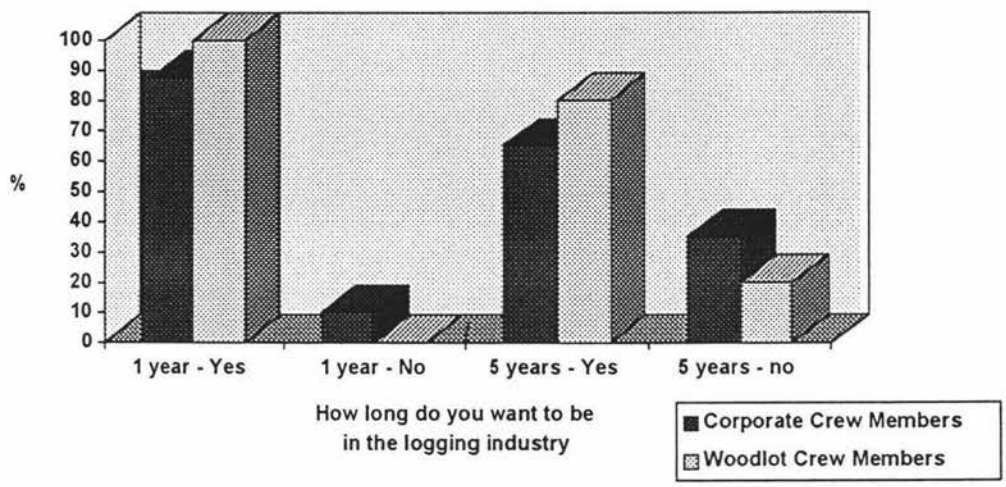
6.3.2.8 Correct FIRS modules for present task

All crewmembers were asked whether they had the correct FIRS module for the task they were doing at the time of participation. Twenty three percent of corporate crewmembers and eighteen percent of woodlot crewmembers did not have the correct FIRS modules for their tasks.

6.3.2.9 Future intentions

Nine percent of all crewmembers did not want to be in the logging industry in one year. However, when the crewmembers were asked whether they wanted to be in the logging industry in five years, thirty six percent answered no. When observing the crew/organisation types, there were varying results (see Figure 6.2).

Figure 6.2: Future intentions of staying within the logging industry



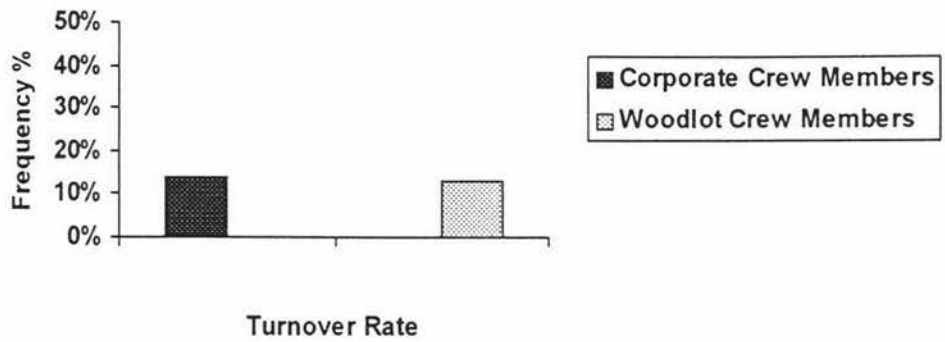
There was a definite rise in predictions of individual members leaving the logging industry from within one year to within five years. The majority of both corporate and woodlot crewmembers predicted that they would stay within the logging industry for more than five years. Woodlot crewmembers did however, have greater intentions of staying within the logging industry than the corporate crewmembers.

6.3.2.10 Turnover rates of subjects

All the contractors were asked how many crewmembers had left their crew in the past year. The turnover rates (see Figure 6.3) show that corporate crewmembers (14% of their crewmembers had left in the past year) have slightly greater turnover rates within their crews than woodlot crews (13% of their crewmembers had left in

the past year).

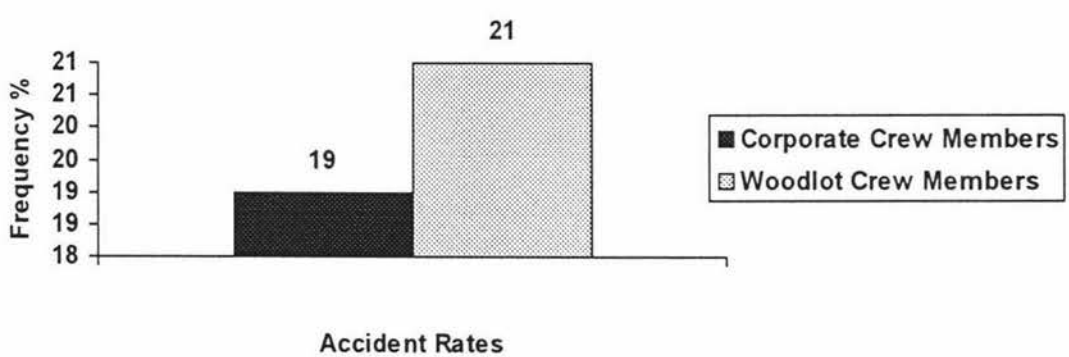
Figure 6.3: Turnover rates of crewmembers



6.3.2.11 Accident rates of subjects

Each crewmember was asked how many lost time accidents (those accidents that cause a period of time absent from work) they had the last one year. Those who had had accidents had only had one over the past year. The length of time each crewmember had off due to injury ranged from one day to two weeks. As is illustrated in Figure 6.4, woodlot crewmembers had more accidents within the past year than corporate crewmembers.

Figure 6.4: Accident rates of crewmembers over the past one year



6.4 Procedure

Potential respondents were contacted initially by phone. Each phone call included information about the identification of the researcher, the purpose of the study and the expected utilisation of the study. Once participation was agreed to, times for meeting were negotiated. It was decided by the contractors and the researcher that break times in the working day would be the most appropriate for participation of crewmembers.

The researcher was briefed by the LIRO employee on the safety precautions that must be taken within a crew's working area and the rules of conduct within the forests. Assistance in administrating the questionnaire was provided by a LIRO member. The assistance was provided because of the large number of questionnaires to be administered in a short space of time. Moreover, the researcher lacked knowledge of the some of the forest areas and thus help in locating crews was essential.

When the crews were approached, the researcher identified herself to the contractor firstly, then the crewmembers. Every crewmember was invited to read an information sheet and asked if they had any questions. The crewmembers were told the objectives for the study, and informed of confidentiality, the right to refuse to answer any questions and withdraw at any time, to contact the researcher with any questions, and if needed, to obtain the results of the study. All contractors expressed the wish to receive the results on behalf of their individual crews. Respondents were not asked to sign the information sheet because, by filling out the questionnaire, they were declaring their consent. Before completing the questionnaire, all subjects were familiarised with the correct procedure to be adopted. All members of each of the six crews visited, participated in the study.

The questionnaire took each respondent between 10-30 minutes to complete. During and after participation, the researcher was available to answer any

questions. The longest time taken to complete a questionnaire was by a contractor, due to numerous phone calls received during the researcher's visit. Copies of the questionnaires were left with the contractor for further reference. Copies of the information sheet were left with all respondents and the company representatives who provided crew names and phone numbers.

6.5 Measures

Sample Characteristics: The biographical information obtained was based on the need for general background information. This information was about respondent's age, gender, ethnicity, education at high school, years within the logging and forestry industry, years with present crew (or years in charge of the crew for the contractors), and the number of crews worked for. Information was gathered on the number of FIRS modules (Forestry Industry Record of Skills Modules, or the logging and forestry industry qualifications that recognise competence in correct practices) each respondent had completed, whether the respondents had the correct FIRS modules for the job that they were doing on the day, the job description of task at the time of questioning, the number of accidents over the last five years, and the number of accidents since joining the present crew. Further questions concerning the number of times respondents had left crews on own accord in the past five years, and whether the respondents wanted to be in the logging industry in one or five years were included.

6.5.1 Climate Measure

Psychological Climate: Perceptions of the characteristics of the logging industry work environment were measured by using the Psychological Climate Questionnaire (PCQ) created by Jones, et al. (1979). The PCQ used in the present study is a shortened and modified version of the instrument. The focus of this

scale is broad, in that it asks about perceptions of jobs and work roles, including organisational properties and aspects of leadership styles, and trust.

The original PCQ instrument was made up of 145 items, with many other forms appearing over years of research (James, 1990, cited in Alpass, 1994). The present study however, consists of only 37 of the original 145 items. James and James (1989) used the same scale utilised in the present study. James, et al. (1989) however, utilised one extra PC variable that was found to be inappropriate after the present study's pilot test.

The exclusion of the PC variable 'management concern and awareness' was due to two reasons. Firstly, most subjects participating in the pilot test stated that the questions were a waste of time because they had already answered them in the section about leader trust and support. Moreover, the crewmember respondents confirmed that they had no dealings with 'management', thus had little knowledge of their concern and awareness towards those who dealt with them. As a result, the scale utilised in the present study contained seven perceived work environment variables: role ambiguity, role conflict, job challenge and variety, leader trust and support, leader goal facilitation, work group co-operation, and work group friendliness and warmth. Table 6.2 describes each of the seven PC work environment variables (role ambiguity, role conflict, job challenge and variety, leader trust and support, leader goal facilitation, workgroup co-operation, and workgroup friendliness and warmth).

A number of different items within the questionnaire make up each of the work environment variable. Composites (role ambiguity, role conflict, job challenge and variety, leader trust and support, workgroup co-operation, workgroup friendliness and warmth, leader goal facilitation, leader interaction facilitation) were scored by summing across the relevant items. According to Nunnaly (1977; cited in Schreuder, 1996), the Cronbach alpha levels on items that exceed 0.7 are at an acceptable level. Schreuder (1996) found that most of the PC variables used in his

study (the same variables to be used in the present study) of the rehabilitation service were above the 0.7 level.

Aggregation of the PC variables within crews and across crews types are essential to find group and organisational climate. Aggregation will involve a simple method of averaging individual scores and determining the mean.

6.5.2 Job Behaviour/Perception Measures

Safety Climate: To assess the safety climate of the logging industry, a shortened, but comprehensive, instrument developed by Williamson, et al. (1997) was used. The five dimensions of safety climate measured were personal motivation for safe behaviour, positive safety practice, risk justification, fatalism, and optimism (see Table 4.1). Each of these dimensions is composed of a number of items within the instrument.

The safety climate measure asks respondents to rate safety aspects and perceptions of their work environment on a five point Likert type scale. The scale contained sixteen items, which were derived from an original 32-item instrument, in the interests of briefness and comprehension. The sixteen questions were chosen by dropping items that were highly inter-correlated (correlations >0.4) and on keeping an acceptable alpha of 0.61. This meant that some degree of internal consistency was sacrificed in the interests of developing a practical questionnaire, while maintaining the broad scope of the original items. A pilot test of the short version questionnaire by the developers replicated the long version's alpha coefficients.

The shortened version was chosen for the present study because of the concern for length and time required for administration. It was also chosen on the basis of its focus on providing a questionnaire for 'blue collar' employees. Three questions were left out of the short version for the present study because answering would

involve writing a sentence or paragraph. This was thought to be inappropriate on work sites where the extra time needed which would cut into the respondents' work time. Thirteen items were, therefore, presented to the participants in the present study.

Wording in certain questions was changed. In place of the noun used in the contractors version, 'supervisor', and crewmembers versions contained the noun contractor. For example, "It would help me to work more safely if: my 'supervisor' praised me on safe behaviour", was changed to "my 'contractor' praised me on my safe behaviour" in the crewmembers version.

Organisational Commitment: The present study employs an eight-item measure of organisational commitment by Cook et al. (1980). This again was chosen in part because of its focus on providing scales that are easily completed, suitable for blue-collar workers, and persons with only modest educational attainment.

Buchanan (1974) and Porter et al. (1974) drew this measure of organisational commitment from work. Within the eight items, there are three interrelated concepts; (1) identification or "pride in the organisation, internalisation of organisation's goals", (2) involvement or "willingness to invest personal effort as a member of the organisation" and (3) loyalty which was defined as "affection for and attachment to the organisation, a wish to remain a member of the organisation" (Cook, et. al., 1980).

Cook, et al. (1980) developed their organisational commitment measure as part of a work attitude study of trust, personal need non-fulfilment, and organisational commitment. The organisational commitment items were developed from a large item pool, with two samples of respondents (N=390 and N=260). From this large item pool, only the most effective items were retained (nine items). The first pilot test of the successful nine items provided coefficient alpha results of 0.87 and 0.80

for each sample group, respectively. The coefficient alpha scores of the three sub-scales from two preceding studies were 0.74 (identity), 0.71 (involvement), and 0.87 (loyalty).

The original measure required a seven-point scale, but due to the difficulty of such a scale, and time constraints on work sites, the present study utilised a five-point scale. Another change included deleting one question from the loyalty variable. This item was erased because the pilot test participants felt that it was not applicable to their occupations and that it was already included in other items. The possible range of scores is thus from 8 to 40 with a high score indicating high commitment.

Intention to Turnover: The measure of the respondents' intentions to turnover was measured by what was originally part of the Michigan Organisational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1979). This questionnaire measured work attitudes and perceptions, including a three-item index of employees' intention to leave their job. Responses were originally required on a seven-point scale, but again were changed to a five-point scale for the present study. The mean value across the items constitutes the final score. The coefficient alpha for this questionnaire was 0.83 (n=400).

6.5.3 Adverse Activity Measures

Accident Rates: Each respondent was asked about their own accident rates over the past five years and their rate of accidents within their present crew ("Have you had any lost time accidents in logging during the last five years - if so how many - total lost time", and " Have you had a lost time accident since joining this crew - if so how many - total lost time"?). Information on the official accident rates in the areas surveyed was classified information, thus no real comparison rates were

available to compare the present study's accident rates. The term 'accidents' referred to lost-time accidents, or those accidents that cause one to stop work while recuperating. These questions were provided by LIRO as they felt that they had proved effective in many previous studies.

Turnover Rates: All contractors were questioned about the number of crewmembers that had left their crew in the past year ("How many crewmembers have left your crew in the last year?"). Information on the official turnover rates was also classified information, thus no real comparison rates were available to compare the present study's turnover rates.

6.6 Analytic strategy

The SAS statistical package was employed to examine data and relationships among the variables used in the present study. Various analyses were undertaken. First, the variables were screened for missing data. It was revealed that a small number of the subjects had omitted to answer some items on the questionnaire. Items never exceeded five percent of the total items answered, and it was therefore decided that deleting cases was an undesirable option. Because of the small size of the sample, it was decided to maximise the available data by taking a mean total based on the number of items answered.

The small size of the sample did however affect the type of analysis chosen for the present study. No discriminant/regression analysis could be performed on the present study's variables because accident and turnover rates were at crew level only. This meant that effectively, only six observations would be fitted into a model, too few for a model involving any more than one or two variables.

The relationships between demographic information and PC variables were

therefore examined via analysis of variance and Bonferroni (Dunn) tests were used to ensure accuracy. The relationships between PC variables, job behaviour/perception variables, and the adverse activities were also examined via analysis of variance and Bonferroni (Dunn) correction tests (to ensure accuracy), and correlations (Pearson r's). These analyses had an alpha level set at 0.05.

CHAPTER 7. RESULTS

7.1 Chapter overview.

Chapter 7. presents the results of the present study. Following the descriptive statistics of the sample characteristics, the findings of the various analyses will be presented along with the tables indicating the most relevant results.

The sample is subdivided into two types of crews (Corporate Crews and Woodlot Crews) for the purpose of identifying organisational climate, six separate crews (Corporate Crews 1, 2, 3, 4, and Woodlot Crews 1 and 2) for the expectation of finding knowledge of both contracting companies and crew environments. Also included in the results are two types of statuses (Contractor and Crewmembers). This distinction between contractors and crewmembers was to allow for interpretation of the links between leaders and subordinates.

7.2 Psychological climate

7.2.1 Psychological Climate Perceptions

Descriptive statistics were obtained from the present data, for crewmembers and contractors, on all psychological climate sub-scales scores and the overall/total psychological climate score of each crew (see Table 7.1 and Table 7.2). Averages of crew types and statuses were calculated (see Table 7.3 and Table 7.4). Item averages were also displayed in Table 7.3 and Table 7.4 to show the average response to each PC variable item.

The reader should be reminded that the separation of the contractor and

crewmember data was due to the different versions of the questionnaire that each status group responded to. The different versions were developed to gain an overall picture of the logging industry, that is, both management and workforce relationships, and to present the link between leaders and their subordinates.

Table 7.1 and Table 7.2 presents all psychological climate (PC) variables, namely, role ambiguity, role conflict, job variety and challenge, leader trust and support, workgroup co-operation, workgroup friendliness and warmth, leader goal facilitation, leader interaction facilitation, and the total PC score. As can be seen in Section 7.2.3, there were only two significant differences in variable perceptions, those being crew/organisational types and statuses. These significant differences were in perceptions of role ambiguity and job variety and challenge. Moreover, with only two differences, it is reasonable to assume that there is considerable within-group and across-group consensus. Thus, results will be discussed in terms of group and organisational climates within the logging industry.

As is illustrated in Table 7.1 and Table 7.2, crewmembers from woodlot crew 2 perceived more role ambiguity within their work environment than any other crew, while members of woodlot crew 1 perceived the least role ambiguity. All the corporate crewmembers perceived relatively similar levels of role ambiguity. All the contractors perceived higher levels of role ambiguity than their respective members, with the corporate crew contractors perceiving greater role ambiguity than their woodlot crew counterparts.

All crewmembers and contractors responded similarly to their perceptions of role conflict, with the exception of corporate crew 1's contractor. This contractor perceived considerably greater levels of role conflict than his crewmembers and the other contractors.

Table 7.1 Means and standard deviations of all PC subscales and the total PC for crew members.

	CORP. CREW 1	CORP. CREW 2	CORP. CREW 3	CORP. CREW 4	WDLOT. CREW 1	WDLOT. CREW 2
ROLE AMBIGUITY (Scale: 6-30)	12.00 (2.54)	12.08 (4.10)	12.78 (4.53)	12.50 (2.12)	11.00 (3.61)	14.00 (2.55)
ROLE CONFLICT (Scale: 6-30)	13.9 (3.80)	13.00 (3.15)	13.20 (4.30)	10.70 (3.10)	13.35 (3.50)	10.20 (3.85)
JOB VARIETY AND CHALLENGE (Scale: 6-30)	15.00 (5.14)	16.08 (3.75)	16.26 (3.49)	18.90 (2.64)	17.00 (3.61)	20.20 (3.69)
WORKGROUP CO-OPERATION (Scale: 4-20)	10.50 (1.84)	10.00 (1.86)	11.15 (2.32)	9.90 (2.64)	9.00 (1.73)	10.40 (2.30)
WORKGROUP FRIENDLINESS AND WARMTH (Scale: 4-20)	8.80 (2.15)	9.08 (1.68)	9.59 (1.47)	9.10 (1.79)	10.00 (1.00)	10.00 (1.00)
LEADER TRUST AND SUPPORT (Scale: 6-30)	21.10 (2.92)	20.20 (2.67)	19.70 (3.24)	21.10 (2.85)	19.00 (2.65)	18.00 (2.35)
LEADER GOAL FACILITATION (Scale: 4-20)	11.80 (1.69)	11.33 (1.72)	11.59 (1.47)	12.40 (1.58)	12.33 (1.15)	12.80 (1.10)
LEADER INTERACTION FACILITATION (Scale: 4-20)	17.20 (1.81)	14.33 (2.93)	14.85 (2.68)	14.20 (2.15)	14.00 (1.00)	14.60 (2.30)
TOTAL PC SCORE (Scale: 39-195)	110.30 (6.63)	106.42 (7.43)	109.26 (7.84)	108.80 (3.94)	105.67 (8.74)	115.20 (9.23)

Note. ( ) indicates standard deviation.
Scale indicates that the lowest to highest score possible for each composite.

Table 7.2 Means of all PC subscales and the total PC for contractors.

	CORP. CREW 1 CONTRACTOR	CORP. CREW 2 CONTRACTOR	CORP. CREW 3 CONTRACTOR	CORP. CREW 4 CONTRACTOR	WDLOT. CREW 1 CONTRACTOR	WDLOT. CREW 2 CONTRACTOR
ROLE AMBIGUTIY (Scale: 6-30)	23.00	25.00	18.00	20.00	17.00	15.00
ROLE CONFLICT (Scale: 6-30)	20.00	15.85	14.15	10.00	15.00	15.00
JOB VARIETY AND CHALLENGE (Scale: 6-30)	24.00	23.00	19.00	24.00	22.00	16.00
WORKGROUP CO-OPERATION (Scale: 4-20)	12.00	13.00	9.00	14.00	10.00	8.00
WORKGROUP FRIENDLINESS AND WARMTH (Scale: 4-20)	8.00	11.00	7.00	9.00	9.00	7.00
LEADER TRUST AND SUPPORT (Scale: 6-30)	14.00	14.00	24.00	23.00	22.00	18.00
LEADER GOAL FACILITATION (Scale: 4-20)	13.00	11.00	14.00	14.00	12.00	12.00
LEADER INTERACTION FACILITATION (Scale: 4-20)	12.00	12.00	13.00	13.00	17.00	14.00
TOTAL PC SCORE (Scale: 39-195)	130.00	128.00	121.00	129.00	127.00	108.00

Note. Scale indicates that the lowest to highest score possible for each composite.

For the psychological climate variable, job variety and challenge, only crewmembers from woodlot crew 2 perceived challenge and variety reasonably differently from other crewmembers. They perceived much greater variety and challenges within their work environment than others, especially when compared to crewmembers from corporate crew 1. All the contractors within the present study perceived greater job challenge and variety than their respective crewmembers, with the exception of the contractor of woodlot crew 2. This contractor's perception of challenge and variety was much less than his crewmembers.

All crewmembers and contractors had reasonably similar perceptions of leader trust and support. However, both contractors from corporate crew 1 and corporate crew 2 had very low perceptions of trust and support as compared to other contractors, other crewmembers, and their own crewmembers.

No major differences were found in the variables workgroup co-operation, workgroup friendliness and warmth, and leader goal facilitation. However, crewmembers in corporate crew 1 perceived a much higher level of leader interaction facilitation than any other crews' members. The contractor from woodlot crew 1 also perceived greater leader interaction facilitation compared to his counterparts.

Overall, leader trust and support and leader goal facilitation produced the most agreement within and across crews. Corporate crew 4 members demonstrated consensus from the standard deviations of the total psychological climate score, showing a much stronger group climate compared to the other crews.

Table 7.3 and Table 7.4 illustrates that overall, contractors perceived a much greater level of role ambiguity within their contracting organisations (medium level) than crewmembers did within their crews (mild level). Corporate crew contractors probably influenced this result because of their high scores. No large

differences were found in the average scores of role conflict (medium level), though woodlot crew contractors perceived less role conflict than any other groups. Corporate crewmembers perceived less job variety and challenge, though again, there were no large differences amongst groups. Crewmembers, on average, did perceive less variety and challenge within their jobs (medium level), than did contractors within their jobs (just above average). Overall, crewmembers felt slightly more trust and support towards their contractors than did contractors towards their supervisors (all just above average). This was also the case for workgroup friendliness and warmth (medium levels) and leader interaction facilitation (medium to just above average levels). Both contractors and crewmembers had similar averages for workgroup co-operation (mild levels) and leader goal facilitation (medium levels).

Table 7.3 Averages of psychological climate variables perception across crew members

CREW	ROLE AMBIGUITY (Scale: 6-30)	ROLE CONFLICT (Scale: 6-30)	JOB VARIETY AND CHALLENGE (Scale: 6-30)	WORKGROUP CO-OPERATION (Scale: 4-20)	WORKGROUP FRIENDLINESS AND WARMTH (Scale: 4-20)	LEADER TRUST AND SUPPORT (Scale: 6-30)	LEADER GOAL FACILITAT. (Scale: 4-20)	LEADER INTERACTION. FACILITATION (Scale: 4-20)	TOT. PC (Scale:39-195)
Corp. Crew Member Ave(n=59)	12.34	12.7	16.56	10.39	9.14	20.54	11.78	15.15	108.7
Average per item	2.06	2.54	2.76	2.6	3.05	3.42	2.95	3.79	2.86
Wdlot. Crew Member Ave(n=8)	12.5	11.78	18.6	9.7	10	21	12.57	14.3	110.44
Average per item	2.08	2.36	3.1	2.43	3.33	3.5	3.14	3.58	2.91
Total Average per item for Crew Members	2.07	2.45	2.93	2.52	3.19	3.46	3.05	3.69	2.89

Note. Scale indicates that the lowest to highest score possible for each composite.

Table 7.4 Averages of psychological climate variables perception across contractors.

CREW	ROLE AMBIGUITY (Scale: 6-30)	ROLE CONFLICT (Scale: 6-30)	JOB VARIETY AND CHALLENGE (Scale: 6-30)	WORKGROUP CO-OPERATION (Scale: 4-20)	WORKGROUP FRIENDLINESS AND WARMTH (Scale: 4-20)	LEADER TRUST AND SUPPORT (Scale: 6-30)	LEADER GOAL FACILITAT. (Scale: 4-20)	LEADER INTERACTION. FACILITATION (Scale: 4-20)	TOT. PC (Scale:39-195)
Corp. Contractor Ave (n=4)	21.5	15	22.5	12	8.75	18.75	13	12.5	127
Average per item	3.58	3	3.75	3	2.92	3.13	3.25	3.13	3.34
Wdlot. Contractor Ave(n=2)	16	15	19	9	8	20	12	15.5	117.5
Average per item	2.67	3	3.17	2.25	2.67	3.33	3	3.88	3.09
Total Average per item for Contractors	3.13	3	3.46	2.63	2.8	3.23	3.13	3.15	3.22

Note. Scale indicates that the lowest to highest score possible for each composite.

Results are also provided for the psychological climate composite variable scores, that is, the psychological climate variable collated into suitable composites. The composite variables within the present study are role stress and lack of harmony, job challenge and autonomy, leader facilitation and support, and workgroup co-operation, friendliness, and warmth. See Table 7.5 for these results.

Table 7.5 Means of psychological climate's composite variables from crewmembers and contractors (n=67,6).

CREW TYPE	ROLE STRESS AND LACK OF HARMONY (Scale: 12-60)	JOB CHALLENGE AND AUTONOMY (Scale: 6-30)	LEADER FACILITATION AND SUPPORT (Scale: 15-75)	WORKGROUP COOPERATION, FRIENDLINESS AND WARMTH (Scale: 7-35)
Corporate Crew Members (n=59)	25.04	16.56	47.47	19.53
Corporate Contractors (n=4)	36.50	22.50	44.25	20.75
Woodlot Crew Members (n=8)	24.28	18.60	47.87	19.70
Woodlot Contractors (n=2)	31.00	19.00	47.50	17.00
Crew Members Average per item	**2.24**	**2.93**	**3.41**	**2.80**
Contractors Average per item	**3.07**	**3.46**	**3.29**	**2.70**

Table 7.5 shows the perceptions of the four psychological climate composites of both the corporate and woodlot crews members were very similar. Only the perceptions of the job challenge and autonomy showed differences in statuses perceptions. The woodlot crewmembers perceive more opportunity to make full use of their abilities, skills, and knowledge. They also have a greater perception of the ranges of tasks, equipment and behaviours available within their roles/job. The corporate crew contractors perceived greater role stress, job challenge and variety, and workgroup friendliness and warmth than their crewmembers and woodlot contractors. On the other hand, the woodlot crew contractors perceived greater leader facilitation and support than other contractors.

The overall averages per item for the psychological climate composite variables

(see again Table 7.5) illustrate that there is low to mild perceptions of role stress and lack of harmony, but more so for crewmembers. Contractors obviously feel there is more variety and challenge within their jobs than crewmembers. Crewmembers scores, were below 3, the middle point of the scale, thus they only perceive mild challenges and variety within their roles. Crewmembers felt more leader facilitation and support than contractors, though both were above medium level, tending towards reasonably high perceptions of this variable. Both contractors and crewmembers had similar perceptions of workgroup co-operation, friendliness and warmth. However, both had low to mild perceptions of this variable, showing a lack of co-operation, friendliness and warmth within their respective work environments.

7.2.2 Differences in psychological climate based on demographic factors

An analysis of variance was performed on the total of all eight PC variables, four of the demographic variables (age, gender, ethnicity, and education or years at high school) and the different subject groupings (crew, crew-type, and status) in the present study. There were no significant gender relationships, ethnicity relationships, or education relationships with the overall/total PC results and the subject groupings. However, there was a marginally significant relationship between contractor's PC perceptions and their age groups $F(2,5)=2.5$ $p<0.08$. The younger age group (25 to 40 years) had a much higher overall PC score compared to the over 40 age group. See Table 7.6 and Table 7.7 for the ANOVA results between the demographic variables and the overall PC variables.

It must be noted that some of the subject groups of the total sample were very small (for example, women), thus significant effects are unlikely to be evident.

Table 7.6 Crewmembers overall psychological climate's relationships with age, gender, ethnicity, and education factor

	n	Mean (Scale: 39-195)	Standard Deviation
Crewmembers age			
UNDER 25	28	107.96	8.73
25-45	23	109.52	6.27
OVER 45	13	111.54	6.10
Crewmembers gender			
MALE	61	109.43	7.63
FEMALE	6	106.00	1.10
Crewmembers ethnicity			
NZ EUROPEAN	23	108.22	6.32
NZ MAORI	41	109.93	8.02
OTHER	3	105.00	2.00
Crewmember HS Education			
OVER 3 YEARS	30	109.47	9.59
UNDER 3 YEARS	37	108.84	4.96

Table 7.7 Contractors overall psychological climate's relationships with age, gender, ethnicity, and education factors.

	n	Mean (Scale: 39-195)	Standard Deviation
Contractors age			
UNDER 25	0	0	0
25-45	3	128.67	1.53
OVER 45	3	119.00	10.15
Contractors gender			
MALE	6	123.83	8.38
FEMALE	0	0	0
Contractors ethnicity			
NZ EUROPEAN	4	123.25	10.24
NZ MAORI	1	121.00	.
OTHER	1	129.00	.
Contractors HS Education	3	121.67	11.85
OVER 3 YEARS	3	126.00	4.58
UNDER 3 YEARS			

7.2.3 Differences in psychological climate perceptions between subject groupings

The results from an analysis of variance indicate that there were significant differences in the perceptions of the psychological climate sub-scale, role ambiguity and job variety and challenge, between contractors and crewmembers (see Table 7.8). No other differences were found between the status groups.

There were also no significant differences found between corporate crews and woodlot crews in the perceived psychological climate variables. This illustrates that both crew/organisational types have similar climates.

Table 7.8 Significant differences in role ambiguity perceptions between contractors and crewmembers.

PC ROLE AMBIGUITY	CORPORATE CREWS	WOODLOT CREWS	TOTAL
CONTRACTORS	4 (21.50) SD(3.11)	2 (16.00) SD(1.41)	6 (19.67) Mean Score/ no. of items 3.28
CREW MEMBERS	59 (12.46) SD(3.77)	8 (12.88) SD(3.14)	67 (12.50) Mean Score/ no. of items 2.08
PC JOB VARIETY AND CHALLENGE			
CONTRACTORS	4(22.5) SD(2.38)	2(19.00) SD(4.24)	6(21.33) Mean Score/ no. of items 3.56
CREW MEMBERS	59(16.46) SD(3.84)	8(19.00) SD(3.93)	67(16.76) Mean Score/ no. of items 2.79

Note. ( ) indicates mean.
SD( ) indicates standard deviation.

As is illustrated in Table 7.8, the differences in the status group's means were very large. The contractors perceived greater role ambiguity within the logging industry and their contracting organisation ($p>.01$). On the other hand, the crewmembers perceived a much lower level of role ambiguity within their work environment $F(7k,65)=3.41$ $p<.01$. Contractors also had perceived greater job variety and challenge $F(7,65)=2.65$ $p<.01$. Table 7.9 and Table 7.10 illustrate the ANOVA results for these PC variables.

Table 7.9 ANOVA analysis of contractors and crewmembers role ambiguity perceptions

Source	SS	df	MS	F
Between	334.82	7	47.83	3.41
Within	911.507	65	14.03	
Total	1246.33	72		

Table 7.10 ANOVA analysis of contractors and crewmembers job variety and challenge perceptions.

Source	SS	df	MS	F
Between	261.52	7	37.36	2.65
Within	915.11	65	14.08	
Total	1176.63	72		

7.3 Safety climate

7.3.1 Safety climate variable scores and the differences between subject groups
The following table, Table 7.11 and Table 7.12, present the descriptive statistics of the five safety climate variables as perceived by both crewmembers and contractors for each crew and their respective crew/organisational type.

Safety optimism was low for both contractors and crewmembers. The contractor for corporate crew 1, especially, felt very little optimism about not having an accident. The contractor for corporate crew 2 on the other hand, felt a lot of optimism, that is, he reflected a very favourable view of personal accident risk. Woodlot crew 1 members also felt that they were not under much personal risk of an accident, and on average, the woodlot crewmembers were more optimistic. Both corporate crew contractors and woodlot crew contractors had similar perceptions of personal risk. The item averages illustrate that crewmembers were less optimistic than their respective contractors, though both groups overall felt little optimism. It seems that most participants in the present study realise the risk involved when working in the logging industry.

With reference to the fatalism variable, both the crewmembers and contractors in the present study had an above average feeling of lack of control over safety. However, one crew in particular, corporate crew 4, felt less control over their safety than any other contractor or crewmembers.

Crewmembers perceived more safety activity in the workplace than contractors. That is, positive safety practices were more strongly evident to crewmembers than to contractors. This could reflect the fact that supervisors from the respective contracting organisations do not promote safety activity to contractors to as great an extent as contractors do to their crewmembers.

Table 7.11 Mean scores and standard deviation of crewmembers safety climate perceptions (n=67).

CREW MEMBERS	Safety Optimism (Scale: 5-25)	Fatalism (Scale: 6-30)	Positive Safety Practices (Scales: 3-15)	Personal Motivation for Safety (Scale: 2-10)	Risk Justification (Scale: 3-15)
Corporate Crew 1	18.50 (4.45)	15.60 (2.63)	10.40 (2.63)	5.60 (0.70)	9.30 (2.31)
Corporate Crew 2	18.25 (2.86)	15.75 (2.18)	8.50 (2.02)	6.75 (1.06)	9.67 (2.53)
Corporate Crew 3	17.19 (3.97)	16.59 (2.83)	9.81 (2.48)	6.11 (1.78)	8.93 (1.84)
Corporate Crew 4	18.80 (1.75)	16.80 (1.81)	8.70 (2.54)	6.70 (1.25)	8.80 (2.20)
Woodlot Crew 1	21.33 (3.51)	13.67 (1.15)	8.67 (3.06)	5.67 (0.58)	10.67 (0.58)
Woodlot Crew 2	18.20 (2.05)	15.00 (2.00)	8.00 (2.12)	7.40 (0.55)	9.20 (1.10)
Crew Members Item Average	**3.95**	**2.55**	**2.95**	**3.21**	**3.19**

Note. ( ) indicate standard deviation.

Table 7.12 Mean safety climate scores for contractors (n=6).

CONTRACTORS	Safety Optimism (Scale: 5-25)	Fatalism (Scale: 6-30)	Positive Safety Practices (Scales: 3-15)	Personal Motivation for Safety (Scale: 2-10)	Risk Justification (Scale: 3-15)
Corporate Crew 1	28	14	9	4	7
Corporate Crew 2	10	15	9	8	7
Corporate Crew 3	20	15	10	6	11
Corporate Crew 4	18	20	9	5	12
Woodlot Crew 1	21	15	10	7	12
Woodlot Crew 2	17	15	11	8	7
Contractors Item Average	**3.8**	**2.58**	**3.29**	**2.94**	**3.13**

Note. ( ) indicate standard deviation.

For the personal motivation for safety factor, contractors felt that if their supervisors praised them for safe behaviour, and if safety procedures were more realistic, it would help them to work more safely. However, crewmembers perceived that it would *not* help them to work more safely.

The risk justification results illustrate that both crewmembers and contractors feel that when they work unsafely, it is sometimes because of not knowing what to do, having to complete the task quickly, and that the right equipment was not provided or was not working. Contractors from corporate crew 1 and 2, and woodlot crew 2, felt that these factors were usually the reasons for working unsafely, more so

than the other contractors and crewmembers. This was also the case for the average corporate crewmember.

Overall, these results paint the picture that perceptions of supervisors commitment to safety is lacking compared to perceptions of contractors commitment to safety. All the subject groups, including crew types, show that they are reasonably realistic in their perceptions of the risks involved in working in the forest, and that though there are some positive safety practices within the logging industry, when you are busy, safety sometimes has to come second.

Only one significant difference was found between the two crew/organisation types (see Table 13 for details). This difference was in the perceptions of fatalism within their work environment ($p<.05$, see Table 7.14). No other differences between the two crew/organisation types were found. There were also no significant differences found between contractors and crewmembers.

Table 7.13 Fatalism perceptions of the different crew/organisation types.

	NUMBER	MEAN (Scale: 6-30)	STANDARD DEV.
CORP. CREW 1	11	15.45	2.54
CORP. CREW 2	13	15.69	2.11
CORP. CREW 3	28	16.5	2.81
CORP. CREW 4	11	17.09	1.97
CORPORATE CREWS	**63**	**16.27**	
WDLOT. CREW 1	4	14.12	1.15
WDLOT. CREW 2	6	15.21	1.82
WOODLOT CREWS	**10**	**14.61**	

Table 7.14 ANOVA results of different crew/organisation type fatalism perceptions

Source	SS	df	MS	F
Between	48.30	7	6.9	1.16
Within	386.58	65	5.95	
Total	434.88	72		

7.3.2 Safety climate and its relationships with psychological climate variables

Table 7.15 and 7.16 demonstrate, using Pearson's correlation coefficients, the relationship between crewmembers and contractors perceptions of safety climate and psychological climate, respectively.

Table 7.15 shows that crewmember's perceptions of fatalism had a significant positive relationship with perceptions of workgroup co-operation. Role ambiguity has a significant negative relationship with positive safety practices and a significant positive relationship with risk justification. Crewmember's perceptions of positive safety practices also had a significant positive relationship with leader interaction facilitation.

Table 7.16 illustrates that there is a significant negative relationship between fatalism and role conflict and a significant positive relationship between contractor's perceptions of risk justification and leader trust and support. There were also significant negative relationships between positive safety practices and role ambiguity, job variety and challenge, and workgroup co-operation.

These correlations suggest that there are links between safety climate and psychological climate, but with only certain variables in the present study. The crewmembers results illustrate that role ambiguity, workgroup co-operation, and leader interaction facilitation are the only psychological climate variables that are correlate with safety climate variables. The contractors results, on the other hand,

show that role ambiguity, role conflict, job variety and challenge, leader trust and support, and workgroup co-operation all correlate with safety climate variables. When looking at the significance levels, workgroup co-operation was very high for both subject groups, thus co-operation within the crew/contracting organisation is an important aspect of safety perceptions.

Table 7.15 Pearson correlation coefficients between safety climate and psychological climate variable scores for crewmembers (n=67).

Variable	Safety Optimism	Fatalism	Positive Safety Practices	Personal Motivation for Safety	Risk Justification
ROLE AMBIGUITY	-0.42 (0.74)	-0.07 (0.55)	**-0.30** **(0.01)***	0.03 (0.79)	**0.36** **(0.00)****
ROLE CONFLICT	0.07 (0.55)	0.03 (0.82)	-0.13 (0.30)	-0.05 (0.67)	-0.22 (0.07)
VARIETY AND CHALLENGE	-0.11 (0.37)	-0.01 (0.93)	0.07 (0.58)	-0.04 (0.76)	0.08 (0.51)
LEADER TRUST AND SUPPORT	-0.21 (0.84)	-0.21 (0.09)	0.20 (0.10)	0.10 (0.44)	0.16 (0.19)
WKGRP. CO-OPERATION	0.00 (0.99)	**0.32** **(0.00)****	-0.14 (0.27)	-0.14 (0.28)	0.18 (0.15)
WKGRP. FRIENDLI. AND WARMTH	-0.22 (0.08)	-0.01 (0.91)	0.11 (0.37)	-0.06 (0.65)	0.13 (0.29)
LEADER GOAL FACILITATION	0.04 (0.77)	-0.06 (0.66)	-0.17 (0.18)	0.04 (0.75)	0.17 (0.17)
LEADER INTERACT. FACILITATION	-0.12 (0.33)	-0.12 (0.34)	**0.26** **(0.03)***	-0.17 (0.17)	0.14 (0.26)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

Table 7.16 Pearson correlation coefficients between safety climate and psychological climate variable scores for contractors (n=6).

Variable	Safety Optimism	Fatalism	Positive Safety Practices	Personal Motivation for Safety	Risk Justification
ROLE AMBIGUITY	-0.14 (0.78)	-0.04 (0.94)	**-0.89 (0.02)***	0.20 (0.70)	0.38 (0.46)
ROLE CONFLICT	0.44 (0.38)	**-0.87 (0.03)***	-0.06 (0.90)	-0.14 (0.79)	-0.68 (0.13)
VARIETY AND CHALLENGE	0.17 (0.75)	0.31 (0.55)	**-0.94 (0.00)****	0.057 (0.92)	0.18 (0.74)
LEADER TRUST AND SUPPORT	0.07 (0.90)	0.50 (0.31)	0.29 (0.58)	0.00 (0.99)	**0.91 (0.01)***
WKGRP. CO-OPERATION	-0.14 (0.79)	0.55 (0.26)	**-0.93 (0.00)****	0.06 (0.91)	0.07 (0.90)
WKGRP. FRIENDLI. AND WARMTH	-0.56 (0.25)	0.18 (0.73)	-0.65 (0.17)	0.67 (0.14)	0.05 (0.92)
LEADER GOAL FACILITATION	0.51 (0.30)	0.48 (0.33)	-0.13 (0.80)	-0.60 (0.21)	0.55 (0.25)
LEADER INTERACT. FACILITATION	0.11 (0.84)	-0.05 (0.93)	0.52 (0.29)	0.25 (0.63)	0.54 (0.27)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

7.4 Organisational commitment

7.4.1 Organisational commitment and the differences between subject groups

There were no significant differences between any of the subject groups, that is, between corporate and woodlot crews and between contractors and crewmembers, in the scores of organisational commitment. The descriptive statistics do however, provide a picture of the perceptions of contractors' commitment towards the contracting organisations (see Table 7.17) and crewmember' commitment towards the crew (see Table 7.18).

In Table 7.17, scores that are low illustrate high perceptions of the variable in question, and vice versa. The corporate crewmembers had a greater perception of organisational identification than their contractors, while woodlot crew contractors perceived a higher level of identification towards their work environment than their crewmembers. Corporate crew 1 contractor had a very low level of identification towards his contracting organisation compared to the other crew contractors, while the corporate crew 3 contractor had a very high perception of identification compared to other contractors. All the crewmembers were similar in perceptions of identification, with woodlot crew 1 members having the lowest perception of identification, but the greatest consensus. Item averages for this commitment variable were similar for both contractors and crewmembers, showing organisational identification as just above average. Corporate contractors and woodlot crewmembers had lower identification than their respective counterparts. Woodlot crewmembers, on average, had the greatest organisational involvement, as did corporate crew 4 when compared to other crewmembers. The corporate crew 2 contractor had the least involvement, with item averages showing that crewmembers felt more organisational involvement than the contractors. However, item averages also showed that there was only a mild perception of willingness to invest personal effort as a member/contractor of the crew/organisation, for the sake of the crew/organisation.

Table 7.17 Means and standard deviations of crewmembers organisational commitment scores (n=67).

Crew Members	Organisational Identification (Scale: 3-15)	Organisational Involvement (Scale: 3-15)	Organisational Loyalty (Scale: 2-10)
Corporate Crew 1	7.90(3.31)	8.90(2.42)	6.40(1.71)
Corporate Crew 2	7.58(3.32)	8.00(2.83)	5.92(2.19)
Corporate Crew 3	8.70(2.52)	8.70(1.66)	6.00(1.33)
Corporate Crew 4	7.80(3.05)	7.00(2.00)	5.30(1.64)
Woodlot Crew 1	10.67(0.58)	8.67(2.89)	6.67(1.53)
Woodlot Crew 2	8.20(1.79)	5.80(2.17)	5.60(2.51)
Crew Members Average Mean	**8.48**	**7.85**	**5.98**
Crew Members Item Average	**2.91**	**2.62**	**3.01**

Note. ( ) indicate standard deviation.

Table 7.18 Means of contractors organisational commitment scores (n=6).

Contractors	Identification (Scale: 3-15)	Involvement (Scale: 3-15)	Organisational Loyalty (Scale: 2-10)
Corporate Crew 1	15	11	6
Corporate Crew 2	11	15	8
Corporate Crew 3	4	7	7
Corporate Crew 4	7	3	2
Woodlot Crew 1	7	8	6
Woodlot Crew 2	10	10	6
Contractorss Average Mean	9	9	5.83
Contractors Item Average	2.96	3	2.94

Note. ( ) indicate standard deviation.

Corporate crew 4 contractor showed a greater perception of organisational loyalty, when compared to the other contractors. Crewmembers showed little variance in their loyalty levels within and across crew types. This was also the case when

comparing the averages of each crew type. The item average again showed that crewmembers and contractors felt only moderate levels of loyalty.

7.4.2 Relationships between organisational commitment and psychological climate

The correctional results provided information that there are some relationships between logging industry crewmember's and contractor's perceptions of psychological climate and organisational commitment variables (see Table 7.19 and Table 7.20 respectively).

Table 7.19 Pearson correlation coefficients of organisational commitment and psychological climate variable scores for crewmembers (n=67)

	IDENTIFICATION	INVOLVEMENT	LOYALTY
ROLE AMBIGUITY	**0.32** **(0.01)****	0.06 (0.61)	0.00 (0.98)
ROLE CONFLICT	0.19 (0.13)	**0.34** **(0.00)****	**0.28** **(0.02)***
VARIETY AND CHALLENGE	-0.04 (0.73)	-0.17 (0.17)	-0.01 (0.93)
LEADER TRUST AND SUPPORT	**-0.43** **(0.00)****	**-0.27** **(0.02)***	-0.02 (0.88)
WKGRP. CO-OPERATION	**0.25** **(0.04)***	**0.25** **(0.04)***	0.08 (0.53)
WKGRP. FRIENDLI. AND WARMTH	-0.06 (0.62)	-0.11 (0.37)	-0.17 (0.17)
LEADER GOAL FACILITATION	-0.04 (0.73)	0.10 (0.41)	**0.26** **(0.03)***
LEADER INTERACT. FACILITATION	**-0.32** **(0.00)****	-0.00 (0.97)	0.10 (0.42)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

As is indicated in the previous table, any results highlighted represent significant relationships between two of the variables. Organisational identification has

significant positive relationships with role ambiguity and workgroup co-operation, and a significant negative relationship with both leader trust and support and leader interaction facilitation. Organisational involvement showed a significant negative relationship with leader trust and support and a significant positive relationship with role conflict and workgroup co-operation. Organisational loyalty had a significant positive relationship with role conflict and leader goal facilitation.

It should also be noted that organisational identification had more relationships with the psychological climate variables than any of the other organisational commitment variables. Moreover, crewmember's perceptions of organisational identity had much stronger relationships with the psychological climate variables than any of the other organisational commitment variables. All the commitment variables did, however, have more than one relationship with the psychological climate variables. Role conflict, leader trust and support, and workgroup co-operation all proved to have significant relationships with at least one Organisational commitment variable, while leader goal facilitation, leader interaction facilitation, and role ambiguity had significant relationships with one organisational commitment variable. Job variety and challenge and workgroup friendliness and warmth were the only two psychological climate variables that did not have significant relationships with the three organisational commitment variables.

Table 7.20 illustrates that contractors perceptions of organisational identification have a significant negative relationship with leader trust and support. The contractors' perceptions of organisational involvement also have a significant negative relationship with leader trust and support, and leader goal facilitation. Organisational identification however, proved to have a much stronger relationship with trust and support from the supervisor than any of the other correlations. Organisational loyalty had no relationships with any of the psychological climate variables.

Table 7.20 Pearson correlation coefficients of organisational commitment and psychological climate variable scores for contractors (n=6).

	IDENTIFICATION	INVOLVEMENT	LOYALTY
ROLE AMBIGUITY	0.54 (0.27)	0.50 (0.32)	0.20 (0.71)
ROLE CONFLICT	0.74 (0.09)	0.72 (0.11)	0.64 (0.17)
VARIETY AND CHALLENGE	0.31 (0.55)	-0.03 (0.95)	-0.30 (0.57)
LEADER TRUST AND SUPPORT	**-0.93** **(0.00)****	**-0.86** **(0.03)***	-0.45 (0.37)
WKGRP. CO-OPERATION	0.29 (0.58)	-0.04 (0.94)	-0.41 (0.41)
WKGRP. FRIENDLI. AND WARMTH	0.21 (0.70)	0.39 (0.44)	0.10 (0.86)
LEADER GOAL FACILITATION	-0.43 (0.40)	**-0.82** **(0.05)***	-0.59 (0.21)
LEADER INTERACT. FACILITATION	-0.42 (0.41)	-0.29 (0.58)	-0.08 (0.88)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

7.5 Intentions to turnover

7.5.1 Intentions to turnover and the differences between subject groups

The descriptive statistics illustrate the crewmembers (see Table 7.21) and contractors (see Table 7.22) intentions to turnover, and the differences/similarities between crews and their respective crew/organisational types.

Table 7.21 Mean scores and standard deviations of crewmembers intentions to turnover.

Crew Members	Intent to Turnover
Corporate Crew 1	3.73(0.81)
Corporate Crew 2	2.89(0.84)
Corporate Crew 3	2.95(0.75)
Corporate Crew 4	2.70(0.74)
Woodlot Crew 1	3.00(0.67)
Woodlot Crew 2	2.07(0.28)
Crew Member Item Average	**2.81**

Note. ( ) indicate standard deviation.

Table 7.22 Mean scores of contractors intentions to turnover.

Contractors	Intent to Turnover
Corporate Crew 1	3.67
Corporate Crew 2	3.67
Corporate Crew 3	2.67
Corporate Crew 4	2.33
Woodlot Crew 1	3.33
Woodlot Crew 2	3.67
Contractors Item Average	**3.3**

Note. ( ) indicate standard deviation.

As indicated in Table 7.21 and Table 7.22, contractors and crewmembers have average intentions of quitting their work. When comparing crew types, woodlot crewmembers have less intentions to turnover than any other subject group, while

Woodlot contractors have more intentions of quitting than any other subject group. Contractors of corporate crew 1 and 2 do show the greatest intentions of leaving, thus the lower scores of contractors in the other corporate crews would have brought down the overall average for this group. Corporate crew 1 members also had the highest score for intending to turnover out of all the crewmember groups, and out of the entire sample. Overall, crewmembers have less intentions of leaving than contractors.

7.5.2 Relationships between intention to turnover and psychological climate

Correlations indicated that there were some relationships between psychological climate and intentions to turnover variables (see Table 7.23).

Table 7.23 Pearson correlation coefficients of psychological climate and intention to turnover scores for crewmembers (n=67).

	ROLE AMBIG.	ROLE CONFLt	VARIETY AND CHALL.	LEADER TRUST AND SUPP.	WKGRP. CO-OP	WKGRP. FRIENDL. AND WARMT.	LEADER GOAL FACILIT.	LEADER INTER. FACILIT.
INTENT. TO QUIT	-0.10 (0.41)	**0.35 (0.00)****	**-0.39 (0.00)****	-0.10 (0.42)	0.03 (0.80)	-0.05 (0.68)	0.03 (0.84)	0.12 (0.35)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

Table 7.23 illustrates a significant positive relationship between the crewmembers intentions to turnover and their perceptions of role conflict. There is also a significant negative relationship between the intention to turnover and job variety and challenge. Both of these correlations were very strong, showing that role conflict and job variety and challenge have a strong relationship with crewmembers' intentions to leave the crew/industry. No other relationships were found between intention to turnover and psychological climate.

The contractors results also show a significant positive relationship between role conflict and intention to turnover (see Table 7.24). However, contractors perceptions of leader trust and support and leader goal facilitation both had a

significant negative relationship with intention to turnover. Obviously, leadership styles have a lot to do with contractors' intentions to quit their job/contract.

Table 7.24 Pearson correlation coefficients of psychological climate and intention to turnover scores for contractors (n=6).

	ROLE AMBIG.	ROLE CONFLt	VARIETY AND CHALL.	LEADER TRUST AND SUPP.	WKGRP. CO-OP	WKGRP. FRIENDL. AND WARMT.	LEADER GOAL FACILIT.	LEADER INTER. FACILIT.
INTENT TO QUIT	0.19 (0.72)	**0.36 (0.05)***	-0.15 (0.77)	**-0.83 (0.04)***	-0.24 (0.65)	0.15 (0.78)	**-0.82 (0.05)***	0.00 (1.00)

Note. ( ) indicate significance level
* $p<0.05$
** $p<0.01$

7.6 Turnover and accident rates

7.6.1 Turnover rates within each crew

Turnover rates in the crews participating in the present study show varying results (see Table 7.25).

As is illustrated in Table 7.25, the corporate crews have a higher percentage of turnover (13.56%) than woodlot crews (12.50%). Only one person had left both woodlot crews in the past year, while eight employees had left the corporate crews within the last year. However, the two crews with the highest rates of turnover were woodlot crew 1 (33.33%) and corporate crew 1 (30.00%).

Table 7.25 Descriptive statistics of the turnover rates within each crew and crew/organisational type.

CREW	NUMBER OF EMPLOYEES LEFT OVER THE LAST YEAR	PERCENTAGE (TURNOVER RATE/CREW SIZE)
CORPORATE CREW 1	3	30.00%
CORPORATE CREW 2	2	16.67%
CORPORATE CREW 3	1	3.70%
CORPORATE CREW 4	2	20.00%
CORP. CREWS TOTAL	**8**	**13.56%**
WOODLOT CREW 1	1	33.33%
WOODLOT CREW 2	0	0
WOODLOT CREW TOTAL	**1**	**12.50%**

Note. % indicates the percentage of turnover within the past one year.

7.6.2 Turnover rates and their relationship with organisational commitment, intention to turnover, and psychological climate variables

There was a significant positive relationship between the turnover rates of crews and contractors perceptions of the psychological climate variables, role ambiguity and workgroup friendliness and warmth (see Table 7.26). These results imply that contractors perceptions of their respective contracting companies affect turnover. When a contractor perceives a high level of role ambiguity and workgroup friendliness and warmth, turnover rates fluctuate.

There were no other significant relationships between the turnover rates within the participating crews and contractors' and crewmembers' psychological climate variable scores. No significant correlations were found between turnover rates and the contractors' and crewmembers' perceptions of organisational commitment and intention to turnover variables.

Table 7.26 Pearson's r correlation coefficient results of relationships between turnover rates and contractors psychological climate variable scores (n=6).

	Overall Turnwer Rate within Crews
Role Ambiguity	**0.87 (0.02)***
Role Conflict	0.30 (0.57)
Variety and Challenge	0.75 (0.08)
Leader Trust and Support	-0.53 (0.28)
Wkgrp. Cooperation	0.68 (0.13)
Wkgrp.Friend. and Warmth	**0.90 (0.02)***
Leader Goal Facilitation	-0.48 (0.33)
Leader Interaction Facilitaiton	-0.25 (0.63)

Note. ( ) indicate Prob > R.
* $p<0.05$.

7.6.5 Accident rates within each crew and crew/organisational type

The number and percentages of accidents within each crew over the past year can be seen in Table 7.27. None of the six contractors in the present study had had an accident over the past one year, but the contractors were included in these results as they are considered to be part of the crews. Results also showed accidents that only occurred while working for the present crew.

Table 7.27 Accident rates within each crew for the past one year (n=73).

CREW	NUMBER OF ACCIDENTS	PERCENTAGE RATE
CORP. CREW 1	1	9.10%
CORP. CREW 2	3	23.08%
CORP. CREW 3	2	7.14%
CORP. CREW 4	4	36.36%
OVERALL PERCENTAGE FOR CORP. CREWS		**18.92%**
WDLOT. CREW 1	1	25.00%
WDLOT. CREW 2	1	16.67%
OVERALL PERCENTAGE FOR WDLOT. CREWS		**20.84%**

Note. % indicates the percentage of turnover within the past one year.

As indicated in Table 7.27, woodlot crews have a higher percentage of accidents than the corporate crews. However, some of the corporate crews do have a high rate of accidents. These crews are corporate crew 4, with an accident rate of 36.36% over the past year, and corporate crew 2, with an accident rate of 23.08%. It seems that corporate crew 1 and 3 reduced the overall corporate accident rate with 9.10% and 7.14% respectively. Woodlot crew 1 also had a high accident rate (25.00%).

7.6.6 Relationship between accident rates, safety climate variables and psychological climate variables

There was one significant relationship between the contractors perceptions of safety climate and the accident rates. These results are presented in Table 7.28.

Table 7.28 Pearson correlation coefficient results of relationships between accident rates and contractors safety climate variable scores (n=6).

Variable	Safety Optimism	Fatalism	Positive Safety Practices	Personal Motivation for Safety	Risk Justification
CREW MEMBER ACCIDENT RATE	-0.43 (0.39)	**0.80** **(0.05*)**	-0.29 (0.58)	0.24 (0.64)	0.44 (0.38)

Note. ( ) indicate Prob > R.
* $p<0.05$.

Fatalism was the only safety climate variable that was related to the crewmember

accident rate. Fatalism was positively related, implying that the greater the perception of the lack of control over safety on the part of the contractor, the greater the accident rate in the crew.

The crewmembers' safety climate perceptions showed no significant relationships with accident rates. The crewmembers and contractors psychological climate perceptions also proved to have no significant relationships with the accident rates.

CHAPTER 8. DISCUSSION

8.1 Chapter overview

The last chapter is the discussion section of the present study. Firstly, a general discussion of the psychological/organisational climate, safety climate, commitment, and intentions to turnover of logging industry members will be presented. The research questions introduced in chapter 5 will also be considered and discussed. Furthermore, the limitations of the study will be presented. Suggestions will be given, implications will then be examined, and conclusions and recommendations for further research will be suggested.

8.2 General discussion of findings

8.2.1 Psychological/organisational climate perceptions of logging industry members

Results illustrated that contractors believed their roles were being confused with other jobs and tasks from the forestry organisations. Overall, contractors perceived much more ambiguity within their roles than crewmembers. In other terms, contractors felt that there was a high level of confusion because of the demands placed on them by other jobs and tasks. This is understandable as contractors have many roles within one day. They are a worker, a leader, and a business manager. Rizzo, et al. (1970) stated that role stress like ambiguity could cause poor performance and job dissatisfaction. Action must be taken by the forest companies and contractors to create a more structured and defined work role.

Both contractors and crewmembers perceived that their performance was affected by pressures from supervisors and contractors, respectively, or as one contractor stated: 'When you are busy and supervisors say that there is a greater felling rate needed, other roles like safety supervision have to come second'. Although contractors and crewmembers felt medium levels of conflict within their roles, this level of role stress can still cause poor performance and job dissatisfaction (Rizzo et. al., 1970). Role conflict has also been found to be a good predictor of adverse activities such as accidents and turnover (Billingsley, et. al., 1992). Whether these adverse activities are affected by role conflict is a question yet to be discussed, but no matter what, conflict perceived by members can only disrupt an organisation.

Contractors of the present sample perceived higher job challenge and variety than their respective crewmembers, which again seems evident because of the high rate of ambiguity felt about their jobs. Higher job variety and challenge perceived by contractors suggests that contractors are more likely to be satisfied within their roles than crewmembers (Gerhart, 1987; Baron, et. al., 1989; cited in Schreuder, 1996).

On the other hand, crewmembers still perceived a medium level of variety and challenge within their jobs. However, if one requires happy and satisfied crewmembers, one must make ways to provide more variety and challenge within their roles.

The data from the present study illustrated that contractors perceived an average level of co-operation from supervisors of the forestry organisation. However, overall, both crewmembers and contractors perceived below average level of co-operation from the crews and forestry organisations, respectively. These results imply that tasks within their work environment are only sometimes being done with co-operation from their respective team members. This suggests that steps must be taken by both contractors and forestry companies to harmonise

relationships between all work groups. Emotional exhaustion (O'Driscoll, et. al., 1988), high turnover rates (Riggar et. al., 1987), and increased accident rates (Guastello, 1991) are all related to poor work relationships. Without taking notice of the above recommendations, further problems are likely to be created, and existing problems may increase.

Crewmembers perceived more warm and friendly relations, trust and mutual liking among crewmembers, than contractors did from the forestry organisations. However, both groups perceived an average level of work group friendliness and warmth. Average work group friendliness and warmth should not necessarily be interpreted as positive. In such a hazardous and ever changing work environment, good relationships among members are very important for creating strong teams who show concern towards each other. Contractors should make a point of creating better working relationships among their crewmembers, selecting new members on compatibility with existing members, and encouraging a greater team focused approach to work. Supervisors from the forestry organisations must also take steps to create an atmosphere that is friendly and trusting. As contractors feel less friendliness and warmth from their supervisors, and working relationships are so important in creating both an effective and efficient work environment, the forestry organisations should try to formalise steps towards creating better relationships with the work force.

Results also indicated that there was a slightly above average perception of both crewmembers and contractors respective leaders being aware of and responsive to their needs. It also shows that both groups felt that their leaders showed a reasonable consideration for feelings of personal worth, and that they had an above average degree of confidence and trust in the leaders.

Crewmembers and contractors perceived their leader encouraging involvement in group goals as average. Involvement in group goals is an important work-related factor for any organisation. Feelings of helplessness and lack of recognition can be

created when one feels they are not contributing with their leader to the overall team goals (Blake, et. al., 1964). As group decisions affect the entire group, both contractors and forestry organisations must include those affected in goal decision making. As the crewmembers, and contractors, are the ones who are at the start in meeting market demands as they take part in manufacturing the product, they are the ones who know what goes on. Incorrect and ineffective decisions can easily be made when those who are doing the job do not contribute to decisions about that job. As one contractor stated about the forestry organisations, 'they have no idea of what they are sometimes demanding us to do'.

Crewmembers and contractors perceived an above average level of leader interaction facilitation. Obviously contractors, and supervisors from the forestry organisations, are trying to help create close work groups. However, from the results obtained, methods used by contractors and company supervisors to create cohesiveness among members are not as good as it could be. More effort needs to go into developing better work group relations. As stated before, many problems have been found to occur due to individual's perceptions of the lack of co-operation and friendliness among team members (O'Driscoll et. al., 1988; Riggar et. al., 1987).

The leadership results illustrate that contractors and supervisors styles of leadership could be enhanced. Many researchers have noted that leadership is an important organisational factor that affects organisational climate perceptions (Indik, 1968; Lewin, 1951; Blake, et. al., 1964). Leaders are the key filters of worker's climate perceptions, thus they help create what an individual feels about a work environment (Schneider, 1983). What leaders do within this work environment could either help or decrease perceptions that lead to job satisfaction, excellent job performance, and overall wellbeing in the work environment.

8.2.2 Safety climate perceptions of logging industry members

As the results illustrated, the safety climate of the logging industry can be interpreted as relatively insufficient in an industry that is known to be dangerous.

Fatalism and safety optimism should be acknowledged as a problem. By having a below average level item score for this variable, both crewmembers and contractors are saying that they perceive a lack control over their safety. This may be realistic as logging work always includes danger but when they: are overrunning safety procedures just because they are busy; perceiving that if they worried about safety all the time they would not get their job done; can't avoid taking risks in their jobs; and feel accidents will happen no matter what they do, this realism should be seen as going too far. The first steps to create better perceptions should be taken by the forestry organisations. Production pressure must be reduced to a level where all contractors and crewmembers feel they can work safely.

The respondents' data also implied that crewmembers perceived more positive safety practices than contractors do. This could be seen to reflect that supervisors from the forestry organisations do not promote safety activity as much as contractors do to crewmembers. Hofmann, et al. (1995) found that workers whose supervisors never mention the issue of safety, could develop perceptions of safety as being unimportant, therefore not attempting safe behaviour. Supervisors from the forestry organisations must attempt to at least acknowledge these findings. If contractors feel that there is no emphasis on safety from the forestry organisations, they may find that levels of accidents will not decline. Commitment is needed, and as Dejoy (1990) stated, "the attitudes and actions of management shape the safety climate of the organisation and can influence the safety performance of the entire workforce" (p.14).

The personal motivation for safety variable also reflects that contractors felt that if their supervisors praised them for safe behaviour and safety procedures were more

realistic, it *would* help them to work more safely. However, the results showed that crews perceived that these factors would *not* help them to work more safely. This suggests that supervisors are not providing enough positive endorsement for contractors. Obviously, the more support for safe behaviour from supervisors and forestry organisations, the more contractors will work safely. Supervisors must also find a more practical safety procedure guideline if they hope to reduce accident rates.

Perceptions of risk justification showed that both crewmembers and contractors have a range of average level perceptions of working unsafely because of not knowing what to do; trying to complete the task quickly, and the right equipment not being provided or not working. A better training regime is needed from both contractors and forestry organisations, more and better equipment is needed, and again, more realistic production levels must be set, if accident levels are to fall.

8.2.3 Organisational commitment of logging industry members

Commitment within the logging industry was reasonably low. Crewmembers have more loyalty towards their crews than contractors do towards their forestry organisations. On the other hand, contractors felt that they had more involvement with the forestry organisations than crewmembers do. Also, both crewmembers and contractors had reasonably low to average level of identification with their crew or forestry organisation, respectively.

The results illustrated that contracting organisations need to try and increase the loyalty of their contractors by creating a sense of belongingness in contractors that can develop into a 'wish to stay' (Cook, et. al., 1980). The forestry organisations should also take steps in developing the contractors pride in the respective organisations and convey goals and values that are realistic if they want their contractors to feel an identification with them, and ultimately, commitment towards them. Contractors, themselves, need to help crewmembers become more

involved within their roles if they are to create a level of commitment that could combat the turnover rate problem. Furthermore, organisational identification and loyalty should be acknowledged as problems due to the high rates of turnover among crewmembers. Committed people are more likely to remain with a crew or organisation and work toward organisational goals (Mowday, et. al., 1982).

8.2.4 Logging industry members' intentions to turnover

The overall intentions to turnover were reasonably low or just above average. Woodlot contractors had the least intentions to turnover, whereas woodlot crewmembers had the most intentions to turnover. Both contractors and crewmembers should observe these behavioural intentions, because in combination with only moderate commitment, and high turnover rates, these intentions to turnover could create many problems.

Riggar et. al. (1987) discovered that leaders in the rehabilitation field had immediate control over three of the four reasons why the behavioural intentions of their workers created turnover. This suggests that contractors and supervisors are the ones within the forestry organisations that must take action in reducing the intentions to turnover to minimal levels. Focus must be on creating more commitment because previous research (Mowday et. al., 1982; Parasuraman, 1982) implies that one must start at enhancing commitment, and in turn, should find the level of intentions to turnover diminish.

8.3 Discussions of findings in respect to the research goals.

8.3.1 Psychological, group, and organisational climate of the logging industry

Question One: Are there differences between crews, crew types, and status (crewmembers and contractors) in their perceptions of psychological climate?

Psychological and organisational climate was apparent in the present study's logging industry sample. Group climate was, however, not as evident. The two status groups had similar perceptions of the psychological climate within the logging industry, though overall, contractors had a more 'negative' view of the logging industry. This suggests that there is a form of 'filtering' of perceptions from contractors to crewmembers.

Psychological climate is the focal point of the present study. The model presents climate as a perceptual phenomenon, taking the place of organisational climate as the main focus. Group climate (or crew climate in this case) was added to the revised model, which has a similar role to organisational climate. Group and organisational climate occur only when there is a consensus of climate perceptions by unit members, though, as stated before, these climates may not occur due to differing individual views within their appropriate units.

Recent theoretical development also suggests that a more unit-specific focus on leadership processes is needed. Leadership, or contractors in the present study's case, was thought to be the key filter in the interpretations that help provide the basis for subordinates' climate perceptions (Indik, 1968; Schneider, 1983).

The data from the present study illustrated that psychological climate and organisational climate were evident within the logging industry. The results suggested that there was both an organisation and/or industry climate because there were no significant differences between crew/organisational types. By industry climate, it has been implied that, because there were no differences between the types of crews types and organisations, the climate perceptions are of consensus throughout the entire industry.

Group climate was, however, not as apparent. The standard deviations within crews showed that strong consensus was only present for some variables. This study will therefore conclude that the existence of group climate was not

particularly supported in the present study. As Field, et al. (1989) suggest in their version of the 'new evolution' model, psychological climate can exist without creating group or organisational climate, as they are both dependent on the extent of consensus within individual perceptions. In the present study, the psychological climate of the logging industry members' has created organisational climate, but not group climate.

In respect to Indik (1968) and Schneider's (1983) findings of the link between leader and subordinate's perceptions, the present study found that contractors and crewmembers tended to have similar perceptions. Admittedly, there were differences in the two status groups perceptions (for example, contractors perceived more role conflict than crewmembers), with two of the PC variables being significantly different. However, results also illustrated that contractors had a more negative focus to their work environment (for example, contractors perceived greater role ambiguity and role conflict). The point is therefore, that contractors may be blocking some of the negative aspects of the business, and letting more of the positive aspects through for crewmembers to individually interpret.

Evidence of 'filtering' was therefore apparent. Contractors, or crewmembers unit-specific leaders, could be implied as the key filters in the interpretations that help provide the basis for crewmembers' climate perceptions. Many researchers have noted that leadership is an important organisational factor that affects climate perceptions (for example, Lewin, 1951; Blake, et. al., 1964). What leaders do within this work environment could either help or hinder perceptions that lead to job satisfaction, excellent job performance, and overall happiness (Schneider, 1983).

8.3.2 Correlational relationships among psychological climate variables and job behaviours/perceptions

Question Two: What are the relationships between psychological climate

variables and job behaviours perceptions such as safety climate, organisational commitment, and intentions to turnover? ***Logging industry members PC perceptions were related to safety climate, commitment perceptions and intentions to turnover.***

Research has confirmed that PC can have strong influences on organisational behaviours and perceptions (Forehand, et. al., 1964; Kaczka, et. al., 1968; Lawler, et. al., 1974; Lewin, et. al., 1939; Litwin, et. al., 1968; Waters, et. al., 1974; Pritchard, et. al., 1973; cited in Field, et. al., 1982).

No studies were found on the relationships between psychological climate and safety climate. However, researchers have found that psychological climate (and those variables similar to the PC variables used in the present study) does affect organisational commitment (Billingsley, et. al., 1992; Cook, et. al., 1980; Luthans, et. al., 1992). Perceptions of the work environment (those similar to the PC variables used in the present study) do affect intentions to turnover (for example; Marini, et. al, 1992; Moore, et. al., 1991; both cited in Schreuder, 1996). Specifically, Marini, et. al. (1992; cited in Schreuder, 1996), Parasuraman (1982) and Riggar, et. al. (1987) linked role stress negatively with intentions of leaving.

8.3.2.1 Relationships between logging industry member's psychological climate and safety climate perceptions

Crewmembers perceptions of psychological climate (PC) were found to be directly linked to their perceptions of the safety climate.

Role ambiguity was negatively related to the safety climate variable, positive safety practices, and positively related to risk justification. This suggests that the more role ambiguity perceived by crewmembers, the less the contractor is seen to be committed to safety, the less workplace conditions are perceived as safe, and the more perceived circumstances in which unsafe behaviour can occur.

Obviously role ambiguity should be reduced to a lower level if the circumstances of unsafe behaviours are to decrease, and perceptions of safety practices and management's commitment towards safety are to be increased. This implies that if contractors, with the support of forestry organisations, were to redefine roles, rules, and criteria, thus creating safer perceived work conditions, there would therefore be no need to justify working unsafely because there would not be any need for risk taking.

Contractors perceptions also had a positive correlation between role ambiguity and positive safety practices. As contractors perceived role ambiguity as high, the more these perceptions decrease, the results imply that the perceptions of workplace conditions and the perceptions of the commitment of management to safety will be enhanced. Endorsement from forestry organisations must be forthcoming towards reducing the demands and performance criteria placed on contractors if the safety climate is to improve.

Results on the correlations between crewmembers PC and safety climate perceptions illustrated that there was a positive correlation between work group co-operation and fatalism. This suggests that the better the co-operation from team members to complete tasks, the more importance and controllability of safety felt by crewmembers. As only mild work group co-operation was perceived by crewmembers, contractors must try a new approach to creating closer teams if more importance is to be placed on safety, and greater feelings of control over members safety are to be achieved.

A positive correlation was identified between crewmembers perceptions of leader interaction facilitation and positive safety practices. These results suggest that crewmembers will perceive better commitment from contractors towards safety, and will have better perceptions of a safe work place if contractors encourage teamwork. Crewmembers did perceive above average level of leader interaction facilitation, but safety practices were perceived as only average. Again,

contractors must encourage more teamwork for a better safety climate.

It must be noted that Williamson, et. al. (1997) stated that the understanding of safety climate is very important when assessing safety needs. Safety solutions may fail if the organisations do not take into account the attitudes and perceptions gained from studying safety climate. It is therefore important that both contractors and supervisors from forestry organisations note these findings and take steps to alter some of the negative aspects of the logging industry's safety climate. It should be the 'leaders' role to alter the safety climate because as Dejoy (1985) concluded, "the safety attitudes of the first-line supervisor can have a significant positive or negative effect on the safety level of the work group".

8.3.2.2 Relationships between logging industry members psychological climate perceptions and their commitment

Both organisational identification and involvement had positive relationships with crewmembers perceptions of work group co-operation. This implies that the more work group co-operation, the better the identification with, and involvement in, the crew. These results also suggest that work group co-operation should be acknowledged as an important factor and an area of concern within the logging industry.

Crewmembers perceptions of leader goal facilitation illustrated a positive relationship with their perceptions of loyalty towards their crews. This implies that the more a contractor encourages participation in decision making of group goals and meeting the group goals, the more a crewmember will tend to feel attachment towards the crew and a sense of belongingness that usually becomes a 'wish to stay'. Parasuraman et. al. (1987) stated that leadership is an important factor in workers commitment, and that the more consideration and involvement from a leader, the better the commitment levels of workers.

Organisational commitment, when weak, has been found by many researchers to

contribute to high turnover rates (Mowday et. al., 1982; Parasuraman, 1982). When one can see a relationship between commitment and the workforce's perceptions of the work environment, and turnover rates are considered a problem, superiors should make an effort in improving those variables recommended as most influenced and influencing.

8.3.2.3 Relationships between logging industry member's psychological climate perceptions and intentions to turnover

Both the crewmembers and contractors perceptions of role conflict and intentions to turnover exhibited positive relationships. That is, the more that their role performance is affected by pressures to engage in conflicting behaviours, the more likely they are to intend to quit. These pressures could be seen to ultimately stem from the forestry company's production pressures. All contractors, and some crewmembers, stated that the pressures, which come from the forestry organisations, can be too much. One contractor even stated that he felt that if they could have him out in the forest for 24 hours a day, they would.

The crewmembers perceptions of job variety and challenge had a negative relationship with intentions to turnover. This suggests that the less variety and challenge within their roles (the variety and challenge perceptions were reasonably low), the more tendency the crewmembers will have towards quitting their job. Plans should be put in place to allow for more variety and/or challenge within crewmembers jobs (for example, job rotation).

The trust that supervisors gain from their contractors, and the more support they provide to their contractors should be seen as an important factor in decreasing the intentions to not renewing contracts. This is because there was a negative relationship found between leader trust and support and intentions to turnover.

Intentions to turnover have been found to be one of the major forces in high turnover rates (Baron, et. al., 1989; cited in Schreuder, 1996; Parasuraman, 1982).

Whether or not the intentions of quitting affect the logging industry's turnover rates, these intentions and their relationships with the climate variables should contribute to changes that have been needed in the logging industry for a long time if an efficient and satisfied workforce is to exist. In combination with future intentions and commitment results, these changes should be put in priority if turnover rates are to subside.

8.3.3 Logging industry members' psychological climate perceptions, and their relationships with turnover and accidents

Question Three: What are the relationships between psychological climate variables and adverse activities such as turnover and accidents? ***Contractors PC perceptions were related to turnover rates within the logging industry.***

Interpersonal relationships are said to be associated with turnover (Riggar, et. al., 1987) and injuries (O'Driscoll, et. al., 1988). Leader facilitation and support have been cited as having influence on turnover (Lewin, et. al., 1939) and accidents (Griffiths, 1985; cited in Gibson, 1994; Lewin, et. al., 1939). Role ambiguity and role conflict have also been related to adverse effects like turnover and accidents (Rizzo, et. al., 1970; Newton, et. al., 1987, cited in Schreuder, 1996). Lastly, job challenge and variety has been inadvertently linked with such adverse effects of job dissatisfaction as turnover and accidents (Curry, et. al., 1986; cited in Schreuder, 1996).

The contractors perceptions of role ambiguity were related to crewmember's turnover. This provides further proof that the immediate supervisors, or contractors in this case, set the psychological climate of the crew. No other of the contractors PC perceptions related to turnover or accident rates. Moreover, the crewmembers perceptions of the psychological climate variables, however, did not correlate with their own turnover and accident rates.

The contractors perceptions of role ambiguity were positively related to the overall

turnover rate within crews. This suggests that the more a contractor perceives ambiguity in demands, and criteria with jobs and roles, the higher the turnover rate will rise. This relationship needs to be acknowledged by contractors. That is, contractors must establish a way in which their perceived ambiguity is not 'picked up' by their respective crewmembers. Indik (1968) and Schneider (1983) found that leaders are the key 'filter' of workers work environment perceptions (PC), that is, they can keep their personnel from seeing the bad, and only focus on the positive. This filtering seems to be adequate as crewmembers perceived only mild ambiguity. However, if turnover rates are to be reduced, refinement of the contractors ambiguity perceptions should be one of the first tasks.

Also noted by the contractors during participation was the fact that the company representatives were themselves continually fighting for their jobs in the very competitive environment of forestry organisations. The demands on the supervisors were thus thought to be very difficult. It can therefore be presumed that the company representatives were also dealing with high levels of role ambiguity which may be 'filtering' through on to the contractors. Though the forestry organisations are in a very competitive and demanding industry, supervisors must learn that this kind of role stress can cause very serious problems within an industry that has proven to have many relationships amongst its work environment and adverse activities.

8.3.4 Job behaviours/perceptions of logging industry members and how they affect adverse activities

Question Four: What are the relationships between job behaviours/perceptions and adverse activities such as turnover and accidents? ***Contractor's safety climate perceptions were related to crewmembers accident rates.***

Safety climate has been recognised as having significant effects on accidents (Hofmann, et. al., 1995; James, et. al., 1990; Schneider, 1983; Zohar, 1980; Dejoy, 1985; and Griffiths, 1985; cited in Gibson, 1994).

Commitment and intention to turnover have been found to effect such organisational adversities as turnover rates (Luthans, et. al., 1992; Cook, et. al., 1980, and Alutto, 1972; cited in Schreuder, 1996).

Contractors perceptions of fatalism was found to be related to the crewmembers overall turnover rates. This suggests that the less importance a contractor places on safety, and the less the perceptions of controllability over safety a contractor has, the greater the crewmembers accident rate will rise. This relationship also implies that when a contractor feels more in control over safety, so too will crewmembers, thus crewmembers are less likely to have an accident. Furthermore, these results present further proof that leaders contribute to crewmembers climate perceptions.

Some of the items included in the fatalism variable included; safety works until we are busy then other things take priority, or, if I worried about safety all the time I would not get my job done. Though the contractors perceived mild to average level of fatalism feelings, there should not be any agreement with these statements in such a dangerous industry. Again, this is where production pressure from the forestry organisations comes in. If the workforce of the logging industry is to be a more effective, efficient, and profitable industry, combating problems like accidents, and creating an excellent safety climate is a step in the right direction. More research into the relationship between role overload and unsafe behaviour is overdue.

8.4 General suggestions for the logging industry

The findings from this study suggest that psychological climate may indeed play an important part in work-related behaviours/perceptions, such as, safety climate, organisational commitment, and intentions to turnover, as well as adverse activities, such as, accidents and turnover rates.

In general, the psychological climate of the logging industry lacks a few qualities that very successful organisations tend to possess. In particular is the contractors perception of role ambiguity, which was related to most of the outcome variables within the present study, including crewmember turnover rates. The lack of workgroup friendliness and warmth, more so for crewmembers, also needs to be attended to. Moreover, leader support and facilitation was found to be adequate, though the stronger the leadership and relationships with leaders, the better the filtering of interpretations that provide some basis for subordinates' perceptions of climate (Indik, 1968 and Schneider, 1983).

The safety climate of the logging industry could also be interpreted as insufficient in an industry known for it's hazards. The perceived lack of control over the subjects own safety, the common consensus that safety works until you are busy, and working unsafely because of the lack of knowledge and incorrect equipment illustrates how much the contractors and ultimately, the forestry organisations must acknowledge a very serious problem, especially in role overload. As both contractors and crewmembers tended to perceive these work related factors similarly, it should be the contracting organisations responsibility in creating a more positive and effective safety climate. Williamson, et. al. (1997) concluded that changes in attitudes and perceptions about safety can often result from safety interventions, thus the knowledge of the safety perceptions gained from this study could be used as the basis for overdue changes.

Commitment within the logging industry was competent enough, though more loyalty is needed for a more committed workforce. Loyalty has been labelled as the subjective well being at work and materialises into 'a wish to stay' (Cook et. al., 1980), thus the greater the loyalty, perhaps the more satisfied and committed the workforce. Intentions of quitting were also found to be moderate. With the turnover problems within the logging industry, enhancing commitment and lowering intentions to turnover should take priority. Mowday et. al. (1982) and

Parasuraman (1982) suggest that to lower the levels of intentions to turnover, one must heighten the perceptions of commitment.

Only the contractors perceptions of psychological climate and safety climate were related to turnover rates and accident rates, respectively. These high levels of turnover and accident rates are those which were the ultimate object of judgement for the present study. Though no other variables were found to be related to the major problems of the logging industry, obviously the crewmember's leaders have a great effect on these adverse activities.

Lowering the contractors perceived ambiguity by the contracting organisations is very important. That is, contractors must be more informed on things that they need to know about their work, job responsibilities need to be more clearly defined, and more clarity is needed on who has the authority to make decisions regarding their jobs, how their jobs fit into the overall objectives of the contracting organisation, and the extent that it takes for advancement within the logging industry needs to be defined.

Commitment towards establishing contractors feelings of greater control over safety should also be paramount, as their fatalism perceptions were related to crewmembers accidents. That is, changes in the perceptions of; safety works until we are busy then other things take priority; if I worried about safety all the time I would not get my job done; I cannot avoid taking risks in my job; and accidents will happen no matter what I do. These negative perceptions should be the responsibility of contracting organisations, as most of the contractors pointed out, 'they don't give a stuff'. Changes in every level of the logging industry's hierarchy therefore need precedence.

8.5 Limitations of the present study.

Several limitations to the current study must be acknowledged. One obvious limitation was the sample size, thus raising issues of statistical power (Rosnow & Rosenthal, 1989). Therefore, when interpreting the relationships between variables caution must be exercised. Another limitation is that the largely theoretical base of Field, et al.'s (1989) 'new evolution' model may lessen the generalisability of findings.

Unfortunately, because of the need to delete questions from the original questionnaire (see Section 6.1), the validity of the composites may have been compromised. It is therefore, that the researcher must ask that the results and discussion be treated as trends and generalisations.

Despite the limitations, conjectural speculations are possible. The F-tests and Pearson's correlations resulted in only a few statistically significant differences or correlations. However, directions of the results, for the most part, complied with the trends discussed in literature about psychological climate and its effects on the work environment.

8.6 Conclusions and suggestions for future research.

Limitations, summaries and the implications of the results have been discussed throughout the discussion. However, some general conclusions will now be considered. The findings from the present study indicate that psychological climate and organisational climate may indeed play an important part in the work-related behaviours/perceptions and adverse activities of logging industry members. Relationships between psychological/organisational climate, safety climate,

organisational commitment, intentions to turnover, accident and turnover rates were evident throughout the present study. Support of the study's model was therefore, mostly apparent.

The study provided information that was not totally expected. Though perceptions were not all positive, they were not as negative as predicted. During a time when woodlot crews were under threat of non-continuance of contracts, and corporate crews had just received the new output expectancies, much to the dismay of the contractors, the perceptions of their work environment were not totally critical. The logging industry is very unique in its environment for research, thus there are many areas of research that should not be assumed.

The present study's model offers a potentially plentiful area for future research because the logging industry provides many advantages for comparative studies of work related stress outcomes, especially role overload. The actual evolution of the logging industry's climate could also be particularly interesting.

As the amount of information was limited for comparison of the entire logging industry, future research would have more benefit from the access of data from the contracting companies. For example, the number of sick days, voluntary absences, health claims and total accident information provide hard outcome measures for possible inclusion in research designs.

More abstract investigations of the interventions in the logging industry environment to improve the climates, perceptions, and adverse activities would also be of particular interest. A longitudinal study of changes of psychological climate and its affects on adverse activities is another area of interest, as would knowledge of the actual contracting organisation's climates.

From what was identified by the present study's results, the first step should be acknowledgement by both the management and workforce that those members

working out in the forest make the organisations what they are. Without them market demands would not be met. A more satisfied and content workforce performs efficiently and effectively, with commitment, dedication, and loyalty. Some the perceptions and relationships identified by the present study's results need to be improved, with all parties of the logging industry's hierarchy taking an active part.

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APPENDIX 1

THE QUESTIONNAIRES AND INFORMATION SHEET USED IN THE PRESENT STUDY

MASSEY
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FACULTY OF
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DEPARTMENT OF
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Psychological Climate of the Logging Industry

INFORMATION SHEET

Researcher: Kelly Rothwell - a student at Massey University currently undertaking a Masters Degree - Phone (06) 3535361

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Mark Sullman (LIRO) - Phone (07) 3487168

Kia Ora, Hello,

Massey University and LIRO invite you to participate in a study of the psychological climate of the logging industry. **Psychological climate represents individual's views of their work environment**. By studying the psychological climate, we hope to learn more about why people are leaving the logging industry and why there are so many accidents.

You do not have to take part in this research, but if you do you will be asked to answer a questionnaire. If you choose to participate, you can refuse to answer any or all questions at any time without any affect on you or your job.

Any information that you give will be confidential. No names will be included in any reports or publications and it will not be possible to identify individual participants in the study. The results will be published as part of the researchers thesis for a Masters Degree and a LIRO report, and will be available to any other parties that may be interested.

If you have any questions about this study, please feel free to ask the researcher at any time.

THE INFORMATION PROVIDED BY PARTICIPANTS WILL BE TREATED AS HIGHLY CONFIDENTIAL AND INDIVIDUALS WILL NOT BE IDENTIFIABLE.

FILLING IN THE QUESTIONNAIRE SHOWS CONSENT.

THANK YOU. ☺

(Contractor's Version)
PSYCHOLOGICAL CLIMATE QUESTIONNAIRE

FILLING IN THIS QUESTIONNAIRE SHOWS **CONSENT**

AGE:_____

SEX: Male/Female

RACE: NZ European
NZ Maori
Other (Please Specify) _____

NUMBER OF YEAR(S):- with Logging? _____
with Silviculture?_____

HOW MANY YEARS DID YOU SPEND AT HIGH SCHOOL?
Circle One: 0 1 2 3 4 5 6

How long have you been in charge of this crew? _____ **Years** _____ **Months**

How many crews have you worked for? _____

How many crew members have left your crew in the last year? _____

How many FIRS modules do you have? _____

Do you have the correct FIRS module for the job that you are doing today? Yes / No

What task are you doing today?
Circle One

Faller Skid-worker Log-maker
Breakerout Loader operator Skidder operator
Bell operator Hauler operator
Other (Please Specify)_____

Have you had any lost time accidents in logging during the last five years? Yes / No

If so, how many? _____ Total lost time? _____

Have you had a lost time accident since joining this crew? Yes / No

If so, how many? _____ Total lost time? _____

How many times have you left a crew on your own accord in the past five years?_____

I want to be in the logging industry in one years time? Yes / No

I want to be in the logging industry in five years time? Yes / No

PLEASE TURN PAGE ☞

FOR EACH OF THE FOLLOWING ITEMS, CIRCLE ONE NUMBER WHICH BEST SHOWS THE WAY YOU SEE YOUR WORK SITUATION:

FOR EXAMPLE:
Safety works until we are busy then other things are done first

If you agree with this sentence, but not strongly agree, you would rate it like this:

1 2 3 4 5
Strongly agree **Strongly disagree**

How often are you kept informed about things you need to know about your work?
1 2 3 4 5
Almost always Practically never

My job responsibilities are clearly defined.
1 2 3 4 5
Strongly agree Strongly disagree

New employees get the on-the-job training they need.
1 2 3 4 5
Strongly agree Strongly disagree

It is clear who has the authority to make a decision regarding my job.
1 2 3 4 5
Strongly disagree Strongly agree

Do you understand how your job fits into the overall objectives of the company you are contracted to?
1 2 3 4 5
Always understand Never understand

To what extent are you aware of the opportunities for promotion in your job?
1 2 3 4 5
Not at all To a considerable extent

Excessive rules and regulations interfere with how well I am able to do my job.
1 2 3 4 5
Strongly agree Strongly disagree

How often do you feel that the amount of work you have to do interferes with how well it gets done?
1 2 3 4 5
Never Almost always

How often do you feel that your job tends to interfere with your personal life?
1 2 3 4 5
Never Almost always

How often do you feel that you have too little authority with the company to carry out your responsibilities?
1 2 3 4 5
Never Almost always

How often do you feel unable to satisfy the conflicting demands between people over you?
1 2 3 4 5
Never Almost always

How much variety is there in your job?
1 2 3 4 5
Very little Very much

How often do you have opportunities to work on different tasks?

1 2 3 4 5

Never Nearly all the time

Opportunities to make full use of my knowledge and skills in my job are:

1 2 3 4 5

Non-existent Outstanding

To what extent does your job challenge your abilities?

1 2 3 4 5

Not at all To a considerable extent

How often do you work on difficult and challenging problems in your job?

1 2 3 4 5

Never Nearly all the time

To what extent does your job require a high level of skill and training?

1 2 3 4 5

Not at all To a considerable extent

How well does your company representative recognise and reward good performance?

1 2 3 4 5

Not very well Extremely well

The company I contract to are almost always certain to hear about mistakes but seldom hear about successes.

1 2 3 4 5

Strongly agree Strongly disagree

To what extent is your company representative willing to listen to your work problems?

1 2 3 4 5

Not at all To a very great extent

To what extent is your company representative friendly and easy to approach?

1 2 3 4 5

Not at all To a very great extent

To what extent does your company representative listen to what you say?

1 2 3 4 5

Not at all To a very great extent

Contractors trust their company representatives.

1 2 3 4 5

Strongly agree Strongly disagree

A spirit of co-operation is present in the company I contract to.

1 2 3 4 5

Strongly agree Strongly disagree

How much friction is there in the company you contract to?

1 2 3 4 5

A great deal Very little

The company I contract to co-operate to get the job done.

1 2 3 4 5

Strongly agree Strongly disagree

Help from the company I contract to in carrying out difficult jobs is:

1 2 3 4 5

Non-existent Outstanding

To what extent is there a friendly atmosphere among the representatives of the company you contract to?

1 2 3 4 5

To a very small extent To a considerable extent

Members of the company I contract to trust each other.

1 2 3 4 5

Strongly agree Strongly disagree

Communication is good in the company I contract to.

1 2 3 4 5

Strongly agree Strongly disagree

To what extent does your company representative emphasise high standards of performance?

1 2 3 4 5

Not at all To a very great extent

To what extent does your company representative set an example by working hard themselves?

1 2 3 4 5

Not at all To a very great extent

To what extent does your company representative encourage people to give their best effort?

1 2 3 4 5

Not at all To a very great extent

All contractors are encouraged to work for promotion/rewards.

1 2 3 4 5

Strongly agree Strongly disagree

How often does your company representative hold meetings where they, you and the crew really discuss things?

1 2 3 4 5

Never Nearly all the time

Generally, how are decisions made in your crew?

1 2 3 4 5

By the company rep. By the crew and you equally

To what extent does your company representative encourage the crew to work as a team?

1 2 3 4 5

Not at all To a very great extent

To what extent does your company representative encourage you to exchange ideas and opinions with the company?

1 2 3 4 5

Not at all To a very great extent

I am quite proud to be able to tell people which company I contract for.

1 2 3 4 5

Strongly agree Strongly disagree

I sometimes feel like leaving the company I am contracted to for good.

1 2 3 4 5

Strongly agree Strongly disagree

I'm willing to put myself out just to help the company I am contracted to.

1 2 3 4 5

Strongly disagree Strongly agree

I feel myself to be part of the company I am contracted to.

1 2 3 4 5

Strongly agree Strongly disagree

In my work I like to feel I am making some effort, not just for myself but also for the company.

1 2 3 4 5

Strongly disagree Strongly agree

The offer of a bit more money with another company would seriously make me think of changing contracts.

1 2 3 4 5

Strongly agree Strongly disagree

I would recommend a close friend to join the company I am contracted to.

1 2 3 4 5

Strongly agree Strongly disagree

To know that my own work had made a contribution to the good of the company I am contracted to would please me.

1 2 3 4 5

Strongly disagree Strongly agree

I will be actively looking for new companies to contract to in the next year.

1 2 3 4 5

Not at all likely Extremely likely

I often think about quitting.

1 2 3 4 5

Strongly disagree Strongly agree

I will probably look for new companies to contract to next year.

1 2 3 4 5

Strongly disagree Strongly agree

Everyone has an equal chance of having an accident.

1 2 3 4 5

Strongly agree Strongly disagree

In the normal course of my job, I do not encounter any dangerous situations

1 2 3 4 5

Strongly agree Strongly disagree

People who do not take the necessary precautions are responsible for what happens to them.

1 2 3 4 5

Strongly agree Strongly disagree

Safety works until we are busy then other things are done first

1 2 3 4 5

Strongly disagree Strongly agree

If I worried about safety all the time I would not get my job done

1 2 3 4 5

Strongly agree Strongly disagree

People who work to safety procedures will always be safe

1 2 3 4 5

Strongly agree Strongly disagree

I can avoid taking risks in my job

1 2 3 4 5

Strongly disagree Strongly agree

Accidents will happen no matter what I do

1 2 3 4 5

Strongly agree Strongly disagree

It is not likely that I will have an accident because I am a careful person

1 2 3 4 5

Strongly agree Strongly disagree

Not all accidents are preventable, some people are just unlucky

1 2 3 4 5

Strongly disagree Strongly agree

Everybody works safely on my work site

1 2 3 4 5

Strongly agree Strongly disagree

I can't do anything to improve safety on my work site

1 2 3 4 5

Strongly agree Strongly disagree

All the safety rules and procedures really work

1 2 3 4 5

Strongly disagree Strongly agree

Our company representative supplies enough safety equipment

1 2 3 4 5

Strongly agree Strongly disagree

It would help me to work more safely if.....

.....my company representative praised me on safe behaviour

1 2 3 4 5

Always Never

.....safety procedures were more realistic

1 2 3 4 5

Always Never

When I have worked unsafely it has been because.....

.....I didn't know what I was doing wrong at the time

1 2 3 4 5

Always Never

When I have worked unsafely it has been because.....

.....I needed to complete the task quickly

1 2 3 4 5

Always Never

.....The right equipment was not provided or wasn't working

1 2 3 4 5

Always Never

THANKYOU FOR PARTICIPATING IN THIS STUDY ☺

(Crew Member's Version)
PSYCHOLOGICAL CLIMATE QUESTIONNAIRE

FILLING IN THIS QUESTIONNAIRE SHOWS **CONSENT**

AGE:_____

SEX: Male/Female

RACE: NZ European
NZ Maori
Other (Please Specify) _____

HOW MANY YEARS DID YOU SPEND AT HIGH SCHOOL?
Circle One: 0 1 2 3 4 5 6

NUMBER OF YEAR(S):- with Logging? _____
with Silviculture?_____

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What task are you doing today?
Circle One

Faller Skid-worker Log-maker
Breakerout Loader operator Skidder operator
Bell operator Hauler operator
Other (Please Specify)_____

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If so, how many? _____ Total lost time? _____

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_____

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1 2 3 4 5

Strongly agree **Strongly disagree**

How often are you kept informed about things you need to know about your work?

1 2 3 4 5

Almost always Practically never

My job responsibilities are clearly defined.

1 2 3 4 5

Strongly agree Strongly disagree

New employees get the on-the-job training they need.

1 2 3 4 5

Strongly agree Strongly disagree

It is clear who can make a decision regarding my job.

1 2 3 4 5

Strongly disagree Strongly agree

Do you understand how your job fits into the overall objectives of the crew?

1 2 3 4 5

Always understand Never understand

To what extent are you aware of the opportunities for promotion in your job?

1 2 3 4 5

Not at all To a considerable extent

Excessive rules and regulations interfere with how well I am able to do my job.

1 2 3 4 5

Strongly agree Strongly disagree

How often do you feel that the amount of work you have to do interferes with how well it gets done?

1 2 3 4 5

Never Almost always

How often do you feel that your job tends to interfere with your personal life?

1 2 3 4 5

Never Almost always

How often do you feel that you have too little authority to carry out your responsibilities?

1 2 3 4 5

Never Almost always

How often do you feel unable to satisfy the conflicting demands between people over you?

1 2 3 4 5

Never Almost always

How much variety is there in your job?

1 2 3 4 5

Very little Very much

How often do you have opportunities to work on different tasks?

1 2 3 4 5

Never Nearly all the time

Opportunities to make full use of my knowledge and skills in my job are:

1 2 3 4 5

Non-existent Outstanding

To what extent does your job challenge your abilities?

1 2 3 4 5

Not at all To a considerable extent

How often do you work on difficult and challenging problems in your job?

1 2 3 4 5

Never Nearly all the time

To what extent does your job require a high level of skill and training?

1 2 3 4 5

Not at all To a considerable extent

How well does your contractor recognise and reward good performance?

1 2 3 4 5

Not very well Extremely well

Where I work, crew members are almost always certain to hear about mistakes but seldom hear about successes.

1 2 3 4 5

Strongly agree Strongly disagree

To what extent is your contractor willing to listen to your work problems?

1 2 3 4 5

Not at all To a very great extent

To what extent is your contractor friendly and easy to approach?

1 2 3 4 5

Not at all To a very great extent

To what extent does your contractor listen to what you say?

1 2 3 4 5

Not at all To a very great extent

Crew members trust their contractors.

1 2 3 4 5

Strongly agree Strongly disagree

A spirit of co-operation is present in my crew.

1 2 3 4 5

Strongly agree Strongly disagree

How much friction is there in your crew?

1 2 3 4 5

A great deal Very little

The crew I work with co-operate to get the job done.

1 2 3 4 5

Strongly agree Strongly disagree

Help from my crew in carrying out difficult jobs is:

1 2 3 4 5

Non-existent Outstanding

To what extent is there a friendly atmosphere among your crew?

1 2 3 4 5

To a very small extent — To a considerable extent

Members of my crew trust each other.

1 2 3 4 5

Strongly agree — Strongly disagree

Communication is good in my crew.

1 2 3 4 5

Strongly agree — Strongly disagree

To what extent does your contractor emphasise high standards of performance?

1 2 3 4 5

Not at all — To a very great extent

To what extent does your contractor set an example by working hard themselves?

1 2 3 4 5

Not at all — To a very great extent

To what extent does your contractor encourage people to give their best effort?

1 2 3 4 5

Not at all — To a very great extent

Crew members are encouraged to work for promotion/rewards.

1 2 3 4 5

Strongly agree — Strongly disagree

How often does your contractor hold group meetings with the crew to really discuss things?

1 2 3 4 5

Never — Nearly all the time

Generally, how are decisions made in your crew?

1 2 3 4 5

By the contractor alone — By the whole crew equally

To what extent does your contractor encourage the crew to work as a team?

1 2 3 4 5

Not at all — To a very great extent

To what extent does your contractor encourage the crew to exchange ideas and opinions?

1 2 3 4 5

Not at all — To a very great extent

I am quite proud to be able to tell people which crew I work for.

1 2 3 4 5

Strongly agree — Strongly disagree

I sometimes feel like leaving this crew for good.

1 2 3 4 5

Strongly agree — Strongly disagree

I'm not willing to put myself out just to help the crew.

1 2 3 4 5

Strongly disagree — Strongly agree

I feel myself to be part of this crew.

1 2 3 4 5

Strongly agree Strongly disagree

In my work I like to feel I am making some effort. not just for myself but for the crew as well.

1 2 3 4 5

Strongly disagree Strongly agree

The offer of a bit more money with another employer would seriously make me think of changing my job.

1 2 3 4 5

Strongly agree Strongly disagree

I would recommend a close friend to join our crew.

1 2 3 4 5

Strongly agree Strongly disagree

To know that my own work had made a contribution to the good of the crew would please me.

1 2 3 4 5

Strongly disagree Strongly agree

I will be actively looking for a new job in the next year.

1 2 3 4 5

Not at all likely Extremely likely

I often think about quitting.

1 2 3 4 5

Strongly disagree Strongly agree

I will probably look for a new job next year.

1 2 3 4 5

Strongly disagree Strongly agree

Everyone has an equal chance of having an accident.

1 2 3 4 5

Strongly agree Strongly disagree

In the normal course of my job. I do not encounter any dangerous situations

1 2 3 4 5

Strongly agree Strongly disagree

People who do not take the necessary precautions are responsible for what happens to them.

1 2 3 4 5

Strongly agree Strongly disagree

Safety works until we are busy then other things are done first

1 2 3 4 5

Strongly disagree Strongly agree

If I worried about safety all the time I would not get my job done

1 2 3 4 5

Strongly agree Strongly disagree

People who work to safety procedures will always be safe

1 2 3 4 5

Strongly agree Strongly disagree

I can avoid taking risks in my job

1 2 3 4 5

Strongly disagree Strongly agree

Accidents will happen no matter what I do

1 2 3 4 5

Strongly agree Strongly disagree

It is not likely that I will have an accident because I am a careful person

1 2 3 4 5

Strongly agree Strongly disagree

Not all accidents are preventable, some people are just unlucky

1 2 3 4 5

Strongly disagree Strongly agree

Everybody works safely on my work site

1 2 3 4 5

Strongly agree Strongly disagree

can't do anything to improve safety on my work site

1 2 3 4 5

Strongly agree Strongly disagree

All the safety rules and procedures really work

1 2 3 4 5

Strongly disagree Strongly agree

Our contractor supplies enough safety equipment

1 2 3 4 5

Strongly agree Strongly disagree

It would help me to work more safely if.....

.....my contractor praised me on safe behaviour

1 2 3 4 5

Always Never

.....safety procedures were more realistic

1 2 3 4 5

Always Never

When I have worked unsafely it has been because.....

.....I didn't know what I was doing wrong at the time

1 2 3 4 5

Always Never

.....I needed to complete the task quickly

1 2 3 4 5

Always Never

When I have worked unsafely it has been because.....

.....The right equipment was not provided or wasn't working

1 2 3 4 5

Always Never

THANKYOU FOR PARTICIPATING IN THIS STUDY ☺