THE EFFECTS OF CO-WORKERS’ EXTRA-ROLE BEHAVIOUR
ON INDIVIDUAL TASK PERFORMANCE AND CLIMATE PERCEPTIONS

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ABSTRACT

Extra-role helping, defined as assisting co-workers with their work tasks, and extra-role voice, defined as arguing for constructive change, are believed to be functional for work groups. However, the mechanisms by which helping and voice might contribute to group effectiveness have not been described in detail, and relatively little empirical research has addressed the effects that helping and voice actually have within groups, or their relationships with outcomes relevant to group effectiveness. I argue that helping and voice will have their most direct and immediate effects on fellow group members, and that these effects may influence the subsequent performance of the group as a whole. I present a cross-level model of task facilitation, which describes the impact that group level helping may have on the task performance of individual group members. I present a cross-level model of climate building, which describes the impact that group level helping and voice may have on the climate perceptions of individual group members. I test hypotheses drawn from these models in three studies. Study one was conducted with 1086 Australian air traffic controllers in 45 groups. The results provided support for the task facilitation mechanism, and showed that group level helping was positively associated with the task performance and effectiveness of individual air traffic controllers. Study two was conducted in an Australian public sector organisation employing over 4000 individuals in 177 groups. The results of this study provided support for the climate building mechanism. Group level helping was positively associated with individual perceptions of affective climate. The effects of group level voice depended on the level of goal clarity within the group. I argued that group members would perceive a greater need for voice when group goal clarity was low, and that under these circumstances, group members would attribute voice behaviour to a genuine desire to benefit the group. Under conditions of high goal clarity, however, group members would not perceive a need for voice, and so the voice behaviours would be attributed to self-serving motives to gain power, influence or resources. Results supported these arguments, with group voice having a negative effect on climate perceptions when goal clarity was high, and a positive effect on climate perceptions when goal clarity was low. In study three I examined the impact of attributions for voice behaviour directly. I conducted an experiment with 69
second year management students. Students were placed in a simulated organisational context by way of a written vignette. The level of co-worker voice and the motives for voice were manipulated within this vignette to form a two by two factorial design in which the level of voice (no voice vs. some voice) was crossed with co-worker motives (self-serving vs. altruistic). Manipulation checks showed that participants attributed the co-worker’s behaviour to self-serving motives in the self-serving condition, and to altruistic motives in the altruistic condition. The results showed that voice behaviour had a negative impact on climate perceptions when self-serving attributions were made. When altruistic attributions were made, the presence or absence of voice did not influence climate perceptions. The results of the three studies suggest that extra-role helping and voice form important parts of the technical, social and psychological environment in which group members work. Furthermore, this environment can have important effects on the task performance and climate perceptions of group members. To the extent that group effectiveness depends on high levels of individual task performance and positive climate perceptions, these outcomes will influence subsequent group effectiveness. I close by discussing the contribution of the task facilitation and climate building models, and the practical implications of the results obtained within this thesis.
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STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature

Date
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CHAPTER 1: INTRODUCTION AND THESIS OVERVIEW

Extra-role behaviours are discretionary behaviours that are not enforceable requirements of an employee’s job (Van Dyne, Cummings & Parks, 1995). In this thesis I examine two extra-role behaviours: helping, defined as voluntarily assisting co-workers with their work tasks (Organ 1988); and voice, defined as constructively arguing for change (Van Dyne & LePine, 1998). In their 1995 review of extra-role behaviour, Van Dyne and her colleagues identified helping and voice as prototypical examples of two fundamentally different types of extra-role behaviour. Helping is an affiliative extra-role behaviour, because it is non-threatening, and because the exchanges involved in helping enhance the relationships among group members. Voice is a challenging extra-role behaviour, because arguing for change can be perceived as threatening, and can damage the relationships between group members. Despite these differences, helping and voice are both believed to be necessary for effective group functioning (Katz & Kahn, 1978; LePine & Van Dyne, 2001; Van Dyne et al., 1995). While this belief is widespread, relatively little research has actually addressed the effects that helping and voice might have within groups, or the relationships between these behaviours and group effectiveness. My aim in this thesis is to examine some of the ways in which helping and voice might be related to group effectiveness.

Theorists have traditionally argued that that helping behaviour will be positively related to group effectiveness (Borman & Motowidlo, 1993; Katz, 1964; Organ, 1988). Helping is argued to “lubricate the social machinery” of work groups (Podsakoff, Ahearne & MacKenzie, 1997, p. 263), maintain the social ties that bind individual members to the group, conserve organisational resources, and enhance the effectiveness of co-workers (Borman & Motowidlo, 1993; Organ, 1988; Podsakoff & MacKenzie, 1997). Unfortunately, these propositions have rarely been tested empirically, and theorists have not specified in detail the mechanisms by which helping might have these effects. The small amount of research that has been conducted has been situated in the domain of organisational citizenship behaviour (OCB), a form of discretionary employee behaviour of which helping is a component (Organ, 1988). When Organ and Konovsky summarised the OCB literature in 1989, they could cite no empirical studies that had investigated the relationship between
OCB and group or organisational effectiveness. As a result, they concluded that the belief in the relationship “rests more on its plausibility than direct empirical support” (p. 158). Since 1989, at least five studies have addressed the relationship between the helping component of OCB and group or organisational effectiveness. These studies have reported positive relationships (Ehrhart, Bliese & Thomas, 2006; Podsakoff et al., 1997), negative relationships (Naumann & Bennett, 2002; Podsakoff & MacKenzie, 1994), and null relationships (Walz & Niehoff, 1996). The null and negative results conflict with the expectations derived from the existing theory, and so calls have been made for more detailed models that can explain the observed variation in empirical results (Bolino, Turnley & Bloodgood, 2002; Organ, 1997; Podsakoff, MacKenzie, Paine & Bachrach, 2000; Schnake, 1991).

Voice is a newer construct within the field of extra-role behaviour, and so most of the research has addressed issues of construct definition (e.g. Graham & Van Dyne, 2006; Van Dyne, Ang & Botero, 2003; Van Dyne et al., 1995) or predictors (e.g. LePine & Van Dyne, 1998; Stamper & Van Dyne, 2001; Withy & Cooper, 1989). Although little empirical research has addressed the outcomes of voice, theorists have argued that group and organizational effectiveness will depend on members’ voice behaviour. Katz and Kahn (1978), writing from systems theory, suggest that organisations require adaptive behaviours that generate “internal modifications to organizational structures to meet the needs of a changing world” (p. 89). Hirschman (1970), arguing from an economic perspective, suggests that voice might assist management to recognise and solve organisational problems and inefficiencies. Voice behaviour has also been identified as an important facilitator of innovation within work groups (Rank, Pace & Frese, 2004). To the extent that voice facilitates beneficial change, therefore, it may be a critical factor that determines group survival.

While voice behaviour may at times be necessary, it can also have a negative effect on the attitudes and affective states of group members. Van Dyne et al. warn that voice can “be destructive if it is overly critical, vague, insensitive, or delivered at the wrong time” (1995, p. 268). Arguing for change may provoke conflict, leading to lower levels of employee commitment and job satisfaction, and increased levels of turnover (De Dreu & Weingart, 2003). These negative effects may undermine the efficacy of voice behaviour as a facilitator of beneficial change, and may affect the way in which voice behaviour is related to group effectiveness. Unfortunately, very
few studies have empirically investigated these effects (but see Erez, LePine & Elms, 2002). As a result, it is difficult to predict whether voice will be positively or negatively related to group effectiveness.

Figure 1.1 illustrates the gap in the literature addressed by this thesis. Theory suggests that there should be a relationship of some kind between helping and group effectiveness, and voice and group effectiveness. However, the theoretical propositions have not been subjected to sustained empirical testing, and the studies that have been conducted have not always supported the existing theory. Further research is needed on the specific mechanisms that might link helping and voice with subsequent levels of group effectiveness. These mechanisms should specify important mediating and moderating variables that might influence the strength and direction of the relationship between helping and group effectiveness, and the relationship between voice and group effectiveness.

Figure 1.1: Gap in the literature addressed by this thesis.

There are a number of ways in which group levels of helping and voice may be linked to group effectiveness. I argue that the most direct and immediate effects of helping and voice will be on the attitudes and behaviours of individuals within the work group. These effects may be significantly related to subsequent levels of group effectiveness. For example, when group members voluntarily help their co-workers,
the immediate effects will be on the individuals being helped. Those individuals might exhibit higher levels of task performance, or become more committed to the group, and in this way the helping may be functional for the group (Podsakoff & MacKenzie, 1997). When group members exhibit voice by arguing for change, the immediate effects will be on the group members who witness those arguments. Those group members might be inspired to support changes or innovations that will benefit the group (Rank et al., 2004). Or they may feel threatened and uncertain, and their perceptions of group morale and cohesiveness may suffer (Stamper & Van Dyne, 2001). The mechanisms that I investigate in this thesis are therefore cross level in nature: they examine the relationship between group levels of helping and voice, and individual level outcomes.

The Multilevel Approach of this Thesis

Researchers often turn to lower level processes when seeking explanations for observed relationships or phenomena. Hackman (2003) cites the example of a psychologist who explains group conflict by examining the cognitions and perceptions of individual group members. According to Hackman (2003), the impulse to examine more basic processes can be criticised as reductionist if researchers assume that the properties of higher level systems can be completely understood by examining their constituent parts. An explanation of group conflict that incorporated only individual behaviour, while ignoring group properties such as size, composition, norms and cohesion, for example, would represent a very limited explanation. Hackman (2003) argues, however, that by examining lower level processes within the context of the higher level systems, and by linking explanatory variables at multiple levels of analysis, researchers can avoid the pitfalls of reductionism while gaining valuable insights into the dynamics of the higher level system.

This type of cross-level or multi-level research is becoming increasing common in workplace contexts in which individuals are organised into higher level groups (e.g. Choi, 2006; Griffith, 2006; Kidwell, Mossholder & Bennett, 1997; Naumann & Bennett, 2000; Ng & Van Dyne, 2005; Yang, Mossholder & Peng, 2007). For example, Yang et al. (2007) recently examined the way in which procedural justice climate (a group level property) influences the commitment and citizenship behaviour of individual group members (an individual level outcome). They found that high levels of group justice climate increased members’ commitment
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to the group and the amount of citizenship behaviours they directed towards the group. Their study helps explain why a high level of procedural justice climate may be functional for work groups: because it increases the commitment and performance of individual members.

In this thesis I seek to understand the relationships between group level extra-role behaviours and group effectiveness. Studies at the group level are important, but Organ (1997, p. 95) argues that these studies can leave us with “a black box of ‘process’” – they can confirm or disconfirm the existence of a relationship, but they provide little insight into why that relationship exists. In this thesis I propose cross-level models that link the group level variables of interest (e.g. size, group helping, group voice, group goal clarity) with individual level outcomes (e.g. psychological climate perceptions, task performance). The individual level outcomes that I assess have been selected because of their potential links with subsequent levels of group effectiveness.

This type of cross-level research requires careful attention to the way in which constructs are conceptualised and operationalised at different levels (Chan, 1998; Morgeson & Hoffman, 1999; Rousseau, 1985). Of particular importance is the articulation of helping and voice at the individual and group levels. These extra-role behaviours are primarily individual level variables: it is the individual group member who helps his or her co-worker, and it is the individual group member who argues for change. Nevertheless, I argue that the aggregated levels of helping and voice within the group can be regarded as meaningful group level properties that can influence the attitudes and behaviours of individuals within the group (Ehrhart & Naumann, 2004; George & Bettenhausen, 1990; Mason, 2006). In chapter 2 I define in more detail the structural and functional relationships between individual and group level helping and voice.

The Proposed Mechanisms

Group levels of helping and voice may affect individual group members in many ways. In this thesis, I focus on two effects that have been mentioned in previous research, but that have not been fully developed as theoretical models, or subjected to sustained empirical analysis. I call these effects task facilitation and climate building. In the task facilitation mechanism I propose that group level extra-role helping can influence the task performance of individuals within the group. For the climate
building mechanism, I argue that group level extra-role voice and group level extra-role helping can influence the climate perceptions of individual group members. These individual climate perceptions can influence the shared climate of the group as a whole, and the extent to which individual members remain with and contribute to the group (Glick, 1985; James & Jones, 1974; Kopelman, Brief & Guzzo; 1990). These effects may ultimately influence the effectiveness of the group as a whole. These proposed mechanisms are shown below in figure 1.2.

Figure 1.2: Proposed mechanisms addressing the gap in the literature.

The Development of the Models

In the following three chapters I develop formal models of the task facilitation and climate building mechanisms. I begin in chapter two by defining extra-role behaviour, and outlining the differences between helping and voice in more detail. I also discuss the operationalisation of these constructs at the group and individual levels, and review the relationships between group levels of helping and voice, and group effectiveness.

In chapter three I describe the task facilitation mechanism. I develop this mechanism within the theoretical context of Campbell’s model of performance (Campbell, 1990; Campbell, McCloy, Oppler & Sager, 1993). Campbell and his
colleagues, drawing on the cognitive models of skill acquisition proposed by Anderson (1985) and Kanfer and Ackerman (1989), propose that the determinants of task performance are declarative knowledge, procedural knowledge and skill, and motivation. I argue that helping within the group can facilitate the exchange of task relevant information among group members (c.f. Podsakoff & MacKenzie, 1997). This information exchange should lead to increases in the declarative knowledge and procedural knowledge and skill of group members, allowing them to exhibit higher levels of task performance.

I argue that these task facilitation effects will be stronger in groups that are more interdependent. In such groups, members will learn more about the skills and knowledge of their co-workers, and so they will be able to provide helping that specifically addresses the skill and knowledge gaps of their co-workers. In more interdependent groups, group members will also realise that their own effectiveness depends on the effectiveness of their co-workers. They will therefore be more strongly motivated to provide assistance that produces a sustained increase in co-worker performance.

In chapter four I describe the climate building mechanism. I develop this mechanism within the theoretical context of Salancik and Pfeffer’s (1978) model of Social Information Processing. I propose that the extra-role behaviours of helping and voice represent highly salient aspects of the interpersonal and social environment within the group, and will therefore influence the affective climate perceptions of individual group members. I also argue that helping and voice will communicate the attitudes and climate perceptions held by the group members who exhibit these behaviours. For example, a group member who exhibits voice may communicate dissatisfaction with the current state of the group; a group member who volunteers to help co-workers may communicate positive and supportive attitudes towards others within the group. These communicated attitudes should influence the climate judgements of individual group members via a social influence process.

I argue that these climate building effects will be moderated by the motives that group members attribute to their co-workers. Specifically, I anticipate more positive effects on group climate when group members attribute helping and voice to an altruistic desire to benefit the group, rather than a self-serving desire for increased power, personal gain or ingratiation (Bolino, 1999; Ferris, Dharm, Bhawuk, Fedor & Judge, 1995).
The Empirical Studies

Having defined the conceptual models, I then describe three empirical studies that test hypotheses derived from the models. The first study concerns the task facilitation mechanism. Supervisory evaluations of performance were obtained for 1067 air traffic controllers (ATCs) in 45 groups. Group level measures of extra-role helping were constructed by averaging the level of helping exhibited by group members. I tested a multi-level mediated model, in which group level helping was proposed to influence individual task performance, which was then proposed to influence individual effectiveness. I examined these relationships in two different ATC environments that differed in their level of task interdependence, with the expectation that task facilitation effects would be stronger in the more interdependent groups.

The second study concerns the climate building mechanism. Self-report survey measures of helping, voice and group climate were administered to 2862 individuals in 177 groups in a large public sector organisation. Group level measures of helping and voice were constructed by averaging the levels of helping and voice exhibited by individuals. I proposed that group helping would have positive effects on individual judgements of affective climate. I proposed that the effects of voice would depend on the level of goal clarity within the group. I argued that under conditions of low goal clarity, group members would perceive a greater need for voice behaviour, and would therefore be more likely to attribute voice to altruistic motives. Under conditions of high goal clarity, however, voice behaviours would be regarded as unnecessary and threatening, and would be attributed to self-serving motives.

The third study was designed to investigate the moderating effects of co-worker attributions on voice behaviour in greater detail. These effects are most appropriately studied under more controlled conditions, in which specific instances of voice behaviour can be isolated, and associated with either self-serving or altruistic motives. In this way, the effect of attributed motive on subsequent climate judgements can be clearly established. I therefore conducted this study using an experimental method. In this study, participants read vignettes which established a group context in which a co-worker exhibited voice for either altruistic or self-serving purposes. I predicted that ratings of the climate within the group would be more positive when altruistic attributions were made.
Table 1.1 below summarises the empirical studies conducted within this thesis. In each study I investigate one of the key moderating variables that I propose will influence the extent to which group helping and voice are functional for the group. In study 1, I investigate the role of task interdependence. In study 2, I investigate the role of group goal clarity. In this study, however, group goal clarity was expected to have its effects because it would influence the attributions that group members made for voice behaviour. In study 3, therefore I investigated the role of attributions directly.

Table 1.1: Mechanisms, extra-role behaviours and moderating variables assessed in each study.

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<td>2</td>
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<td>Helping and Voice</td>
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<td>3</td>
<td>Climate Building</td>
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<td>Attributions</td>
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**Discussion and Conclusion**

In the final chapter I review the theoretical and empirical contributions of the thesis. The main theoretical contributions are the models of the task facilitation and climate building mechanisms. Empirically, the thesis contributes to our understanding of the types of effects that extra-role behaviours might have on individual task performance and individual climate judgements. I then discuss some directions for future research, along with the strengths and weaknesses of this thesis.
CHAPTER 2: EXTRA-ROLE HELPING AND VOICE

In this chapter I define extra-role behaviour in general and describe the two types of extra-role behaviour I will be examining in this thesis: helping and voice. I then address helping and voice as multilevel constructs. Finally, I review the literature on the relationships between helping and voice and group effectiveness. In this review I show that helping and voice may have both positive and negative effects on group effectiveness. I identify two key moderator variables that may influence the relationships between these extra-role behaviours and group effectiveness. These moderators are the level of task interdependence within the group, and the motives to which co-workers attribute extra-role helping and voice.

Extra-Role Behaviour

A role can be defined as the expected pattern of behaviour attached to a position within an organisation (Ilgen & Hollenbeck, 1992; Katz & Kahn, 1978). The expectations encoded within a role specify a wide variety of requirements. Examples include what tasks role holders should perform, how they should interact with others, how they should dress, how they should speak, what opinions and attitudes they should hold, what goals they should work towards and what means they should employ to attain the goals (Sarbin & Allen, 1968).

In-role behaviours are behaviours that employees are expected to exhibit as a function of the role they hold within the organisation. In-role behaviours are subject to expectations for how often the behaviours should be exhibited, and the manner in which the behaviours should be exhibited (Ilgen & Hollenbeck, 1992). Extra-role behaviours can be identified by the absence of these expectations: they are not governed by organisational role expectations, and role holders have a degree of discretion regarding how often the behaviours should be exhibited and the manner in which those behaviours should be exhibited (Van Dyne et al., 1995).

Theorists such as Katz (1964) and Van Dyne et al. (1995) have attempted to develop taxonomies of extra-role behaviour. In doing so, these researchers have focused on identifying those behaviours that are likely to be regarded as extra-role across a wide range of organisational contexts and job types. The behaviours that they
have identified, such as helping co-workers, self-training, and arguing for change, possess certain characteristics that make them less likely to be incorporated into formal role descriptions, and more likely to be regarded as discretionary. These characteristics contribute to our understanding of extra-role behaviour as a general construct, and so I describe three of these characteristics below, with reference to the extra-role behaviours of helping and voice.

First, helping and voice are behaviours that can be exhibited spontaneously by employees at any time (George & Brief, 1992; Katz, 1964). They have no set place in the productive process, and so it is difficult for the organisation to specify in advance the manner in which they should be exhibited, the extent to which they should be exhibited, and who should exhibit them. For these reasons, they are difficult to assign, monitor and enforce as required in-role behaviours. Employees are likely to vary considerably from one another in the extent to which they exhibit these behaviours spontaneously, and this variation will contribute to the perception that the behaviours are discretionary. By contrast, behaviours that form a systematic part of the productive process are expected to be exhibited by specific individuals in a predictable way, and can be easily assigned to formal roles.

A second characteristic is that the knowledge and skills required to exhibit helping and voice are generic, in that they are typically shared by all members of the organisation, and indeed the broader social system in which the organisation is nested. In-role behaviours usually require some specific knowledge and skills, and are therefore regulated by the organisation in order to ensure that they are only exhibited by designated role holders who possess the necessary knowledge and skills (Borman & Motowidlo, 1993). By contrast, the extra-role behaviour of helping does not require any specific ‘helping’ skills beyond those possessed by most people on entry into the organisation. Of course, the domains in which an individual can usefully offer help may be limited by his or her knowledge and skill, but within those domains no additional knowledge or skills unique to the act of helping are required. Voice is similar, in that there are no specific ‘arguing for change’ skills that employees are required to have mastered before they can exhibit the behaviour.

A third characteristic relates to the way that behaviours contribute to organisational functioning. Some behaviours contribute directly and predictably to the organisation’s productive core, either by transforming raw materials into products and services, or by maintaining or managing this process (Borman & Motowidlo, 1993).
Examples include a computer programmer writing code, a manager allocating work, or a production line worker welding car parts together. These behaviours must be exhibited for production to continue, and so they tend to be assigned by the organisation to formal roles. Not all behaviours contribute to organisational effectiveness in this way. Borman and Motowidlo (1993) argued that organisations also depend on contextual behaviours that support the broader social and psychological context in which the technical core is embedded. These behaviours may influence production in the long run; however, the links between contextual behaviours and production are indirect and less predictable. Because production can continue (at least in the short term) regardless of whether or not these contextual behaviours are exhibited, they tend not to be regulated by the organisation. As a result, contextual behaviours are rarely formal parts of an organisational role.

Helping has been nominated by Borman and Motowidlo (1993) as a contextual behaviour, because acts of helping should contribute positively to the social and psychological environment within work groups and organisations. LePine and Van Dyne (2001) have also argued that voice can also be regarded as a form of contextual behaviour. They argue that, like helping, voice behaviour does not relate directly to the transformation of inputs into outputs. Instead, voice is likely to have its most direct effects on the social and psychological environment within the work group. Voice differs from helping in that these social and psychological effects may be challenging rather than supportive (LePine & Van Dyne, 2001). Nevertheless, helping and voice can both be regarded as aspects of contextual performance in that their effects are more likely to be felt on the social and psychological environment, rather than directly on production.

In summary, helping and voice are unlikely to be incorporated by organisations into formal role prescriptions due to their spontaneous nature, because they require little in the way of specific skills or knowledge, and because they are unlikely to have a direct and predictable effect on production. Because these behaviours are external to the formal role, they are likely to be regarded as discretionary by employees. Of course, individual role perceptions are influenced by a range of factors in addition to formal role prescriptions. For example, an organisation may not require a manager to assist his or her peers with their planning, but the manager may still regard that behaviour as an important part of the role as he or she understands it (Parker 1998). Nevertheless, the fact that this behaviour is not formally
required by the organisation will contribute to perceptions that it is discretionary. If, for example, the manager’s relationship with his or her peers were to deteriorate, then helping the peers may be a behaviour that the manager begins to withhold. In this way, the behaviour differs from in-role behaviours that are formally required of the individual, and which must be exhibited.

**Defining Helping and Voice**

Van Dyne et al. reviewed the extra-role behaviour literature in 1995, covering a wide range of behaviours such as organisational citizenship behaviour, whistleblowing, principled organisational dissent and prosocial organisational behaviour. On the basis of their review, they proposed a taxonomy of extra-role behaviour that distinguished between affiliative and challenging behaviours, and prohibitive and promotive behaviours. Promotive behaviours encourage and facilitate action, while prohibitive behaviours are protective and preventative and aim to curtail inappropriate, dangerous or counterproductive behaviour. Affiliative behaviours are interpersonal and cooperative behaviours that support and enhance relationships, while challenging behaviours are aimed at disrupting existing patterns of behaviour and introducing change. Challenging behaviours can damage relationships among individuals, and between individuals and the broader group or organisation. These distinctions produce four types of extra-role behaviour: promotive and affiliative behaviours, promotive and challenging behaviours, prohibitive and affiliative behaviours, and prohibitive and challenging behaviours. Van Dyne et al. (1995) define helping as an affiliative and promotive behaviour, and voice as a challenging and promotive behaviour.

**Helping**

In this thesis I examine voluntary task-related helping between co-workers within a work group. By task related, I mean that the acts of helping are intended to assist co-workers with their work tasks. This type of helping differs from prosocial acts of helping that are not work relevant (Brief & Motowidlo, 1986; McNeely & Meglino, 1994). By voluntary I mean that the helping behaviour is not required of the employee as a function of their role within the organisation. Such acts are affiliative because the exchanges involved in helping strengthen relationships among individuals...
Effects of co-workers’ extra-role behaviour

(Konovsky & Pugh, 1994). Helping is promotive because it facilitates the task performance of co-workers.

Task related helping of this type is an important aspect of what Katz (1964) referred to as cooperative behaviour. Organ (1988), drawing on Katz’s (1964) work, included helping as a component of organisational citizenship behaviour (OCB). Organ (1988) defined helping as discretionary behaviours that were not directly or explicitly recognised by the formal reward system, and that have the effect of helping a specific co-worker with an organisationally relevant task or problem. Examples of helping from the OCB literature include orienting a new co-worker (Smith, Organ & Near, 1983), helping other co-workers to learn about the work (Van Dyne & LePine, 1998) and helping co-workers with heavy workloads (Posakoff, MacKenzie, Moorman & Fetter, 1990). Task related helping is also an important aspect of the interpersonal facilitation aspect of contextual performance, which includes “cooperative, considerate, and helpful acts that assist co-workers’ performance” (Van Scotter & Motowidlo, 1996, p. 525).

Voice

Group members who exhibit voice voluntarily and constructively argue for change (Van Dyne & LePine, 1998). Voice may encompass arguing for changes to group goals or plans, for changes to the way work is conducted, or any other factor relevant to the group’s task. Voice can be distinguished from complaining, because voice requires that the individual exhibit constructive arguments for change, rather than just pointing out problems (c.f. Sportmanship; Organ, 1988). Voice can also be distinguished from proactively implementing change (c.f. Personal initiative; Frese, Kring, Soose & Zempel, 2001), because voice encompasses only arguing for change and does not necessarily require the individual to implement the changes being argued for. Voice is challenging because arguing for change can be perceived as threatening. Furthermore, individuals who support the status quo may feel they are being attacked, and so voice has the potential to damage rather than enhance interpersonal relationships. Voice is promotive because it facilitates change and causes things to happen.

Voice has been conceptualised differently in different fields and over time. The construct has its roots in the exit, voice and loyalty framework of Hirschman (1970). Hirschman (1970) stated that customers of a firm in decline had three choices:
taking their business elsewhere (exit), remaining a customer but complaining (voice),
or remaining a customer and persevering with products or services that were poor in
quality, overpriced, or otherwise deficient (loyalty). Hirschman dealt briefly with
employee voice, but his work was mainly concerned with the economic decisions of
customers, rather than the behaviour of employees.

Withy and Cooper (1989) extended the concept of voice by applying it to
employees. They argued that exit, voice, loyalty and also neglect (withdrawal but not
exit from the workplace) represented the range of employee responses to
dissatisfaction. In their study, voice was operationalised by three behaviours: trying to
convince a supervisor to improve the situation, placing a note in a suggestion box, and
writing a letter to a government agency to find out what can be done to solve the
problem. Their study focused on identifying the predictors of voice, and the results
showed that employees were more likely to exhibit voice when they were previously
satisfied with their jobs, committed to the organisation, had an internal locus of
control, and believed that improvement was possible.

The three voice behaviours that Withy and Cooper (1989) examined would
most likely be regarded as extra-role, however Withy and Cooper (1989) did not draw
on the extra-role literature in their conceptual definition of voice, nor was the role
status of the behaviours discussed. Van Dyne and her colleagues (1995) integrated
voice into the extra-role behaviour field, and used the distinction between challenging
and affiliative behaviour to separate voice from other extra-role behaviours such as
helping. Examples of extra-role voice include communicating opinions even though
those opinions differ from the group majority, speaking up with ideas for changes in
procedures, and making constructive suggestions for improvement (Van Dyne &

Van Dyne and LePine (1998) conducted an important study which
demonstrated that voice and helping could be distinguished from one another
empirically. They assessed self, peer and supervisor ratings of helping, voice and in-
role behaviour, as well as supervisor ratings of individual effectiveness. The results of
a confirmatory factor analysis showed that helping, voice and in-role behaviour all
formed distinct factors that were moderately intercorrelated. Having established a
degree of discriminant validity, the authors then showed that that ratings helping and
voice contributed independently to supervisor ratings of performance.
Helping and Voice at the Group Level

I examine extra-role helping and voice at the individual and group levels. Measuring helping and voice at the individual level is not problematic; however the conceptual and operational nature of group level helping and voice does require some elaboration. I argue that groups can develop and maintain characteristics levels of helping and voice, leading to within group homogeneity and between group differences in the levels of helping and voice exhibited. These characteristic levels of helping and voice can be regarded as properties of the group, and I expect that they will strongly influence the attitudes and behaviours of individual group members. George and Bettenhausen (1990) and Mason (2006) have argued that there are multiple mechanisms by which group members may converge in their attitudes, behaviours, and cognitions. The two mechanisms most relevant to extra-role helping and voice are normative control and attraction-selection-attrition. I explore these mechanisms below.

Extra-role behaviours, by definition, are not regulated by formal role expectations. Thus, there exists a level of uncertainty regarding the levels of extra-role behaviours that group members should exhibit. Under such circumstances, groups will develop informal norms regarding the expected or allowable levels of extra-role behaviours. Group norms mandate a common level of behaviour for all group members, and so a degree of homogeneity in extra-role behaviour will emerge (Ehrhart & Naumann, 2004). Of course, these normative controls will not produce complete homogeneity within a group, because the norms themselves typically specify a range of acceptable variation. Thus, individual members still have some discretion to vary the extent to which they exhibit extra-role behaviour.

The attraction-selection-attrition mechanism (ASA; Schneider, 1987) is another factor that can produce convergence in group members’ behaviour. This mechanism assumes that individuals can choose to join and leave a group, and that groups can choose to accept or reject members. Through ASA processes, groups will tend to attract, select and retain people who are similar to existing members, while dissimilar members tend to leave. To the extent that levels of extra-role behaviour are salient within the group, common levels of extra-role behaviour will be maintained via these processes.

Morgeson and Hoffman (1999) advise researchers to carefully specify the structure and function of multilevel constructs at each level of analysis. In doing so,
researchers can maintain conceptual clarity when discussing the relationships between multilevel constructs and other variables at different levels of analysis. A multilevel construct is structurally isomorphic across levels when the content of the construct encompasses similar events or phenomena at each level (Morgeson & Hoffman, 1999). At the individual level, helping represents the extent to which a person provides task related assistance to a co-worker. I define group level helping as the extent to which group members provide task related assistance to one another. At the individual level, voice represents the extent to which a person argues for constructive change. I define group level voice as the extent to which group members argue for change. The events that define helping and voice are the same at the individual and group levels, and so the constructs are structurally isomorphic across these levels.

The function of a multilevel construct is defined by its relationships with other constructs. A construct can be regarded as functionally isomorphic across the group and individual levels if the effects of that construct are the same at both levels (Morgeson & Hofmann, 1999). Because constructs can have a number of different effects or outcomes, functional isomorphism must be assessed as a matter of degree. Researchers must consider the outcomes that are of interest to them, and assess the extent to which group and individual level operationalisations of the construct might be expected to influence those outcomes in similar ways. In this thesis, my focus is on the way in which group helping and voice affect individual behaviours and attitudes, and so I focus on individual level outcomes in assessing functional isomorphism.

I argue that effects of group helping and voice will be similar in many ways to the effects of individual helping and voice, with only the source of the helping or voice being different. Helping provided collectively by a group may enhance an individual’s level of skill and knowledge, just as helping provided by another individual can do so (Podsakoff & MacKenzie, 1997). Similarly, helping provided by a group may enhance the social exchange relationship between the group and the individual, in the same way that helping provided by an individual can enhance exchange relationship between the helper and the person being helped (Konovsky & Pugh, 1994). Helping can therefore be regarded as structurally isomorphic across the group and individual levels. Voice at the individual and group levels will introduce new ideas and information, and facilitate change. Both individual and group level voice can also be perceived as threatening, and may damage relationships within the
group. I therefore argue that voice can be regarded as functionally isomorphic across the group and individual levels.

The functional and structural relationships between helping and voice at the group and individual levels have implications for the composition models used to form group level variables (Chan, 1998). The composition model that I adopt in this thesis is a direct consensus model, in which group level measures of helping and voice are constructed by averaging the levels of helping and voice exhibited by individuals within the group. Within a direct consensus model, these group level aggregates can be regarded as meaningful properties of the group, to the extent that group processes maintain common levels of helping and voice within the group. As I have argued above, I believe that normative and ASA process will produce common levels of helping and voice within groups.

**Helping and Group Effectiveness**

One of the assumptions within the extra-role literature is that interpersonal task related helping is functional for the group. This assumption manifests itself in a number of different ways. A large number of studies have been conducted examining the predictors or determinants of extra-role helping, based on the belief that promoting extra-role helping will promote group or organisational effectiveness (e.g. Aryee, Budhwar & Chen, 2002; Bateman & Organ, 1983; Farh, Posakoff & Organ, 1990; Konovsky & Pugh, 1994; Settoon & Mossholder, 2002; Smith, Organ & Near, 1983). Existing theory consists almost entirely of arguments that support a positive relationship between extra-role helping and group or organisational effectiveness (e.g. Podsakoff & MacKenzie, 1997; for exceptions see Ferris et al., 1995; Hunt 2002; and Tepper, Duffy & Hoobler, 2004). Consistent with these theoretical expectations, almost no studies have ever predicted or hypothesised a null or negative relationship between helping and outcomes (but see Naumann & Bennett, 2002; Tepper et al., 2004). Despite these beliefs and assumptions, helping has not always been observed to correlate positively with group effectiveness. Below I review some of the empirical research, focusing on possible reasons for the variation in empirical results.
Empirical Studies

One of the first empirical studies of the link between group helping and group effectiveness was published by Podsakoff and MacKenzie in 1994. Supervisors provided ratings of OCB for 839 insurance salespeople working in 116 different units across the United States. Podsakoff and MacKenzie (1994) formed group level aggregates of three different forms of OCB: Helping, sportsmanship and civic virtue. Unit performance was assessed by a composite measure reflecting factors such as the amount of new business and the number of policies sold. At the unit level, civic virtue and sportsmanship were both significantly correlated with performance ($r = 0.25$ and $0.26$ respectively). Raw correlations indicated that there was no relationship between helping and group effectiveness; however when all three types of extra-role behaviour were simultaneously regressed on unit performance, the effect of helping was found to be significant and negative. Thus, the unique variance in helping was found to be associated with lower rather than higher levels of unit performance. This result was unexpected, and the authors offered a number of explanations: It may have been that the helping was not effective in increasing the performance of the agents who were being helped; the high level of turnover in the industry may have meant that the agents who were being helped left before they could effectively apply their new skills; and time spent helping others may have degraded the performance of experienced agents, leading to a net decrease in unit effectiveness.

In 1997 Podsakoff et al. reported a study that further investigated the effects of helping. The study design was similar: helping, civic virtue and sportsmanship were aggregated to the unit level, and correlated with unit level indicators of performance. The context, however, was quiet different. This time they studied machine crews in a paper mill. The crews consisted of four to six people who worked together to operate the machines. The task in this case was therefore more interdependent, with more opportunity for interaction among co-workers. The outcomes assessed were the quality of paper production (percentage of output that passed quality checks) and the quantity of paper production (actual output as a percentage of the theoretical machine maximum). The results showed that helping in the paper mill was positively correlated with both the quantity and quality of paper produced. Furthermore, these results remained consistent when the effects of civic virtue and sportsmanship were accounted for in a regression equation.
Extra-role helping behaviours were further investigated in 31 military units by Ehrhart et al. (2006). Again, the units studied were highly interdependent, with group outcomes relying on cooperative and synchronised work. In this study, helping was positively related to three out of four outcomes studied. These authors also examined the effects of group cohesion and group conflict. The effect of helping on outcomes was smaller when accounting for cohesion and conflict, but it was still significant. The fact that helping shared variance with cohesion and conflict suggests that helping may contribute to group maintenance. That helping had significant effects over and above such variables suggests that there are other ways that helping can also contribute to organisational effectiveness. This result seems to support the idea that there are multiple mechanisms or processes by which extra-role behaviour can influence outcomes.

Walz and Niehoff (1996) assessed five aspects of OCB in a chain of 30 “fast food” Mexican restaurants. Thirteen measures of restaurant effectiveness were used, including area manager ratings, financial results, customer satisfaction, and internal efficiency measures such as food wastage. Helping was positively correlated with revenue as a function of full-time-equivalent staff numbers, operating efficiency and customer satisfaction. There were, however, a number of measures of effectiveness that showed no relationship to helping.

Finally, Naumann and Bennett (2002) collected measures of helping and performance from 220 employees in 34 branches of a banking organisation. Supervisors within each branch evaluated the performance of employees, and these measures were aggregated to the branch level to provide an overall indicator of employee effectiveness. The results showed that group level helping correlated positively with employee effectiveness. Naumann and Bennett (2002) also obtained measures of financial performance from the bank’s records. Group level helping was negatively correlated with this outcome. Naumann and Bennett (2002) suggested that time spent helping may have reduced the overall effectiveness of experienced branch members, thus resulting in a drop in unit level productivity.

The studies reviewed above demonstrate some of the inconsistent results that have been found with regard to helping. Helping has been found to have positive, null and negative effects on group effectiveness. These inconsistent results have prompted researchers to call for more detailed theory regarding the effects of extra-role helping (Organ, 1997; Bolino et al., 2002). Below I review some of the existing theoretical
arguments, and note some of their shortcomings. In chapters 3 and 4 I build on these theories by proposing formal models that link extra-role helping with the task performance and climate perceptions of individual group members.

Theoretical Mechanisms

Researchers have suggested a number of different mechanisms or processes by which extra-role helping might be linked to group or organisational effectiveness (Borman & Motowidlo, 1993; Organ, 1988; Podsakoff & MacKenzie, 1997). These suggestions typically fall into one of three categories: that helping contributes positively to the task performance of co-workers; that helping contributes positively to group maintenance by enhancing morale, climate, or interpersonal relationships among members; or that helping conserves organisational resources. I review these three categories of arguments below.

First, theorists have argued that task related helping contributes to the performance of others, which then impacts positively on group effectiveness. Podsakoff and MacKenzie (1997, p. 136) argued that “employees who help another coworker ‘learn the ropes’ may help them to become more productive employees faster”. The underlying assumption is that co-worker helping contributes to the knowledge or skill of others, allowing them to exhibit higher levels of task performance. Organ (1997) argues that “not every single instance of OCB would make a difference in organizational outcomes; for example, I might offer help to a coworker that actually turns out to be dysfunctional for that person’s performance, but summated across the categories of relevant behaviours, the effect would be positive.” (1997, p. 87).

Second, helping may be positively related to group effectiveness because it represents a form of maintenance behaviour (Bales, 1958). Group maintenance involves ensuring that group members have positive relationships with one another, and hold attitudes and beliefs that are consistent with continued membership in the group and continued role performance (Katz & Kahn, 1978). Helping a co-worker implicitly invites reciprocal acts of helping, and thus helping can serve to enhance relationships (Konovsky & Pugh, 1994). Helping can also communicate positive attitudes towards others (e.g. liking) and the group (e.g. commitment). Without such behaviours, the social and psychological rewards of group membership dwindle, and member engagement and commitment to the group are likely to decrease.
Bolino et al. (2002) linked this argument with the resource based view of the firm. They argued that helping behaviours would contribute to the social capital of organisations in the form of enhanced relationships and networks among employees, higher levels of trust, and more effective cooperation. Social capital is valuable because it promotes cooperation, reduces transaction costs, and facilitates the exchange of information within the organisation. Furthermore, social capital cannot be easily bought or generated, it is inimitable and nonsubstitutable, and for that reason provides organisations with a source of sustained competitive advantage (Barney, 1991).

Third, Organ (1988) and Podsakoff and Mackenzie (1997) argued that when employees volunteer to help each other out the organisation is spared the expense of devoting specialised resources to these functions: “Helpful actions rendered spontaneously, on the spot, make unnecessary the machinery otherwise used for communicating problems to a special office for referral, evaluation or remedy… fewer resources tied up in maintenance means more resources used for immediately productive purposes” (Organ, 1988, p 34). The voluntary helping behaviours of employees can therefore be regarded as a resource that can be harnessed by organisations in pursuit of organisational goals.

Although these arguments represent plausible mechanisms by which extra-role helping may be functional, they have rarely been fully developed as theoretical models (for an exception, see Bolino et al., 2002). As such, important mediating or moderating variables that may affect the relationship between helping and group effectiveness have not been clearly identified or defined. What this means is that one cannot rely on the existing theory alone to identify or understand those situations in which helping does not correlate positive with group effectiveness. However, the existing research does suggest that at least two variables may form important moderators of the relationship between group helping and group effectiveness. These variables are task interdependence and attributions for helping behaviour. I briefly review these factors below. In chapters 3 and 4 I incorporate these variables into the proposed models of task facilitation and climate building.
Task Interdependence

Podsakoff et al. (1997) suggested that task interdependence may be an important factor that influences the extent to which helping within the group relates to subsequent levels of group effectiveness. Podsakoff et al. (1997) suggested that a lack of task interdependence may have accounted for the failure of Podsakoff and MacKenzie (1994) to find a positive effect of helping on group effectiveness in their study of insurance agents. The insurance agents in the 1994 study worked alone to sell policies, and opportunities for task related interaction and cooperative behaviour were limited. As such, the helping that occurred may not have contributed strongly to the skills or knowledge of the agents being helped. The sample of bank employees assessed by Naumann and Bennett (2002) may also have exhibited limited levels of interdependence in the sales oriented behaviours most associated with financial performance. Thus, a lack of interdependence may also account for the negative relationship between helping and unit financial performance in this study. By contrast, studies in highly interdependent environments (e.g. Podsakoff et al., 1997; Erhrart et al., 2006) have tended to find positive effects for helping behaviour.

Attributions

Attribution theory describes the way people attribute causes for social phenomena and human behaviour. Behaviours that distinguish an individual from others, such as discretionary extra-role behaviours, are typically attributed to internal dispositions and intentions rather than external social pressures (Kelly, 1973). Ferris et al., (1995) and Bolino et al., (2002) have suggested that dispositional attributions for extra-role behaviours can be self-interested or altruistic. When a self-interested attribution is made, actors are seen to be exhibiting the behaviour for their own personal gain. An altruistic attribution is made when the actor is believed to be acting in the best interests of the others, such as co-workers or the organisation as a whole. Of course, observers may make altruistic attributions when the actor does experience some personal gain, so long as the observer believes that the behaviour was exhibited with the primary intent of benefiting others.

Tepper et al. (2004) conducted a study examining attributions for extra-role helping among 250 people in a city council. The participants rated the amount of voluntary interpersonal helping exhibited by their co-workers, and also indicated their attributions for those OCBs. Attributions were rated by asking participants why their
co-workers exhibited the helping behaviours. Responses were made on a five point scale ranging from self-serving, “to benefit themselves, to make themselves look good”, to altruistic, “to benefit the organisation and its employees” (p. 460). The dependent measure in the study was job satisfaction, which was also rated by the employees. The results showed that co-workers’ OCB and attributions for OCB interacted to predict job satisfaction. The relationship between co-workers OCB and job satisfaction was negative when self-serving attributions were made, but positive when altruistic attributions were made.

Attributions may be an important factor that moderates the impact that group level extra-role helping has on individuals within the group. If individuals attribute the helping that occurs within the group to self-serving motives, then they may be less satisfied, and have less positive perceptions of the organisational climate. These effects may limit the extent to which helping within the group serves a maintenance function. Alternatively, if individuals attribute the helping behaviours of their co-workers to altruistic motives, then group helping may indeed perform a maintenance function, and may therefore be related to the effectiveness of the group.

**Voice and group effectiveness**

Van Dyne et al. (1995) identify three key outcomes of voice that are relevant to group effectiveness. These are that voice will assist the group adapt to changes in the external environment, that voice will lead to higher levels of innovation, and that voice will introduce creative and constructive suggestions for improvement. All of these outcomes are consistent with the earliest theoretical conceptions of voice as a facilitator of change (Hirschman, 1970; Withy & Cooper, 1989). Voice can therefore be expected to contribute positively to group effectiveness to the extent that the changes facilitated by voice are in fact beneficial for the group.

In addition to these outcomes, voice can also influence the attitudes and affective states of group members, however these effects may not always be positive (Van Dyne et al., 1995; Stamper & Van Dyne, 2001). Group members who exhibit voice may communicate feelings of dissatisfaction through their behaviour, leading to reduced levels of morale and increased negative affect within the group. Voice behaviours also highlight disagreements within the group, and so may be regarded as evidence of poor teamwork or cohesion. These negative effects may undermine the capacity of voice to facilitate beneficial change. For example, a reduction in morale
may mean that the group is less capable of coping with the stress and uncertainty associated with change (Rafferty & Griffin, 2006). These negative effects may also influence group effectiveness by reducing levels of commitment within the group and increasing the probability of turnover (Griffeth, Hom & Gaertner, 2001; Griffith, 2006).

Unfortunately, very few studies that have empirically investigated the consequences of extra-role voice within work groups. One attempt is a study by Erez, LePine and Elms (2002), in which they examined the relationships between voice and group effectiveness in self-managed student teams. Team performance was evaluated by teachers based the quality of case studies prepared for course credit. Members of the team rated the voice exhibited by all other team members, and the ratings were aggregated to form a group level voice index. It is important to note that voice in this context was often likely to be in-role rather than extra-role. The study measured voice using survey items such as “made suggestions to others in this group about changes that might have improved the group”. Behaviours such as this probably represent a typical part of the role requirement for students in assignment teams. The results showed that group voice correlated with group effectiveness at $r = 0.73$. It may be that teams in which members contributed more actively had higher levels of voice, and that both of these factors influenced subsequent group performance. Extra-role voice may, perhaps, have a different relationship with group effectiveness than the type of voice examined in this study. Clearly this is an area where further research is required.

Given the absence of research into extra-role voice as such, I review below some research on task related conflict within work groups. Voice is distinct from conflict, because voice is an individual behaviour rather than a group or dyadic process. However, voice is similar to conflict because they can both threaten relationships (Tidd, McIntyre & Friedman, 2004), and they can both lead to change. Furthermore, an individual who argues for change is likely to find that at least some group members will support the status quo, and will be prepared to disagree with the proposed changes. Voice may therefore lead to or form an important component of task related conflict within groups. For these reasons, understanding the ways in which task conflict relates to group effectiveness may suggest some important avenues for voice research.

Theorists distinguish between two types of conflict: task conflict and relationship conflict (Amason, 1996; Jehn, 1995). Task conflict refers to
disagreements about the task being performed by the group, including conflict over
the interpretation of information, the distribution of resources, group policies and
task conflict as cognitive in nature, as it relates to ideas about the best way to
complete the task. Relationship conflict refers to disagreements about personal issues
that are not task related. Jehn (1995) found that common topics in relationship conflict
were social events, gossip, clothing preferences, political views, and personality
differences. Relationship conflict can arise from and lead to animosity between group
conflict as affect laden, as it is related to the feelings that members have towards their
coworkers.

When task conflict occurs, group members are required to consider opinions
and ideas that conflict with their own. This process is argued to lead more
comprehensive information processing within groups, and to the consideration of
more alternative strategies. Groups that experience task conflict therefore tend to
make better decisions than groups that do not engage in task conflict (Fiol, 1994;
Janssen, Van de Vliert, & Veenstra, 1999). Task conflict, like voice, has also been
linked to innovation in work groups (West & Anderson, 1996). Finally, moderate
levels of task conflict have been found to enhance group effectiveness, although only
in groups where enhanced levels of information processing and decision making are
important determinants of performance (Jehn, 1995). To the extent that voice leads to
task conflict, therefore, one may expect positive relationships with group
effectiveness.

Unfortunately, task conflict is not always associated with positive effects
within groups. Like voice, there is a risk that task conflict can lead to negative
outcomes such as reduced satisfaction and commitment (Amason, 1996; Jehn, 1995).
Recent research suggests that the negative effects of task conflict may arise because
task conflict tends to co-occur with relationship conflict. Studies have consistently
shown that relationship conflict has negative effects on satisfaction, commitment, and
intention to stay with the group (Jehn, 1995; Jehn, Northcraft & Neale, 1999). In their
meta-analysis on conflict, De Dreu and Weingart (2003) report a correlation of 0.52
between task and relationship conflict. It may be, therefore, that the negative effects
of task conflict can be attributed to its association with relationship conflict.
In support of this argument, Medina, Munduate, Dorado, Martínez & Guerra (2005) found that the zero order correlation between task conflict and wellbeing, satisfaction, and intention to leave were significant and negative. However, when controlling for the effects of relationship conflict, they found that task conflict had no correlation with these outcomes. These effects were not symmetric, as the partial correlation between relationship conflict and affective outcomes remained significant and negative when controlling for task conflict. In the meta-analysis by De Dreu and Weingart (2003), the negative effects of task conflict on affective outcomes decreased in magnitude as the correlation between task conflict and relationship conflict dropped.

These results have led researchers to investigate potential moderating factors that might decouple task conflict from relationship conflict. Simons and Peterson (2000) argue that relationship conflict might develop out of task conflict because people misattribute the motives of group members, and thus perceive task related disagreements to be personal attacks. Misattribution may be especially likely when individuals within the group have a degree of ego attachment to the strategies or plans they are arguing for or against (Yang & Mossholder, 2004). Simons and Peterson (2000) argue that group members in conflict will constantly monitor co-workers in order to infer the motives and intentions behind their behaviour. If this attribution process results in disagreements being attributed to self serving motives, then relationship conflict is likely to develop. However, if group members are perceived to be acting out of a genuine desire to benefit the group, then the negative effects of relationship conflict might be avoided.

Voice behaviour, like conflict, may be attributed to either self-serving or altruistic motives. Graham and Van Dyne (2006, p. 89) argue that voice behaviour “at work often is disparaged as self-serving activity that undermines the efficient pursuit of organizational goals”. On the other hand, one of the key predictors of voice behaviour is a desire to benefit the group (Withy & Cooper, 1989). If observers are sensitive to this desire, then voice may be attributed to altruistic motives. The attributions that group members assign for voice may affect the outcomes of voice in the same way that they affect the outcomes of task conflict. If altruistic motivations are inferred, then voice may have largely positive effects within the group, and be associated with increased group effectiveness. If self-serving motivations are inferred,
then voice may be related to negative outcomes such as reduced commitment, satisfaction, and attraction to the group.

I am not aware of any studies that have directly examined the impact that attributions have on the effects of task conflict or voice. However, researchers have examined group contextual factors that may be associated with the attributions made for task conflict. Simons and Peterson (2000) identified trust as a key contextual factor. They argued that disagreements would be attributed to sinister motives or hidden agendas under conditions of low trust. The results supported their hypothesis, with trust moderating the relationship between task conflict and relationship conflict. Specifically, task conflict was only related to relationship conflict when trust was low. Peterson and Behfar (2003) replicated this finding in a longitudinal study, which showed that task conflict at time 1 only predicted relationship conflict at time 2 under conditions of low trust.

Tidd et al. (2004) investigated a different contextual factor, which was ambiguity and uncertainty within the group. They argued that in ambiguous environments, group members are likely to perceive task conflict as an inevitable outcome of group’s attempts to make sense of the task, or even as an appropriate means of surfacing the different ideas, opinions and assumptions of group members. When the task requirements and strategies are clear, unambiguous and agreed upon, however, task conflict will be regarded as unnecessary. Disagreements and arguments for change are therefore more likely to be attributed to self serving motives, such as a desire to gain control over group resources or to facilitate personal advancement. Tidd et al. (2004) found support for their hypothesis, with role ambiguity moderating the relationship between task conflict and relationship conflict. Specifically, task conflict was more strongly correlated with relationship conflict when role ambiguity was lower.

The findings of Tidd et al. (2004) can be applied to understand the effects that voice may have within groups. When tasks, goals, plans and strategies are clear and unambiguous, arguments for change are likely to be regarded as unnecessary, distracting, and a waste of time. As such, voice behaviour is unlikely to be attributed to a genuine desire to benefit the group, because the group does not appear to need voice behaviour. In more ambiguous circumstances, however, voice behaviour may be regarded as a genuine attempt to set a direction for the group. Most individuals find uncertainty and ambiguity to be aversive, and so attempts to alter the status quo are
likely to be regarded positively. Members will therefore be more likely to attribute voice to a genuine desire to benefit the group.
CHAPTER 3: A CONCEPTUAL MODEL OF TASK FACILITATION

In this chapter I describe the task facilitation mechanism. I propose that the extra-role helping behaviours of co-workers can enhance the task performance and effectiveness of individual group members. This mechanism is important because an increase in individual effectiveness can enhance the effectiveness of the group as a whole. I first describe the type of group context in which I expect task facilitation effects to operate. I then describe the theoretical framework within which I develop the task facilitation mechanism, which is the model of performance developed by Campbell and his colleagues (Campbell, 1990; Campbell et al., 1993). Finally I present the model of task facilitation, and describe the propositions that form the basis of this model. Consistent with the research reviewed in chapter 2, I nominate task interdependence as a key moderating variable within the task facilitation mechanism.

Group Context

I define a work group as a collection of interdependent employees who are jointly responsible for group outputs, and who see themselves, and are seen by others within the organisation, as a distinct social entity (Guzzo & Dickson, 1996). I assume that each group has one or more core productive processes by which raw materials and energy are transformed into outputted products or services (Katz & Kahn, 1978). I assume that each group member has a role, which defines the ways in which he or she is expected to contribute to the core productive processes. Furthermore, I assume that group members are able to exhibit a range of extra-role behaviours, including helping, at their discretion.

Campbell’s Model of Performance

In their review of the performance literature, Campbell et al. (1993) found that researchers had used a wide range of ad-hoc employee performance measures, many of which appeared to bear little relationship to one another. For example, performance measures ranged from results on knowledge tests, to sales figures, to error counts. Campbell et al. (1993) argued that the variation in measures reflected a degree of confusion regarding the definition of employee performance, stemming from a lack of
construct oriented research into employee performance. In order to address this shortcoming, Campbell et al. (1993) established a model of performance based on distinctions between employee performance, employee effectiveness, determinants of performance and antecedents of performance. I construct the task facilitation mechanism within this framework, and so in the paragraphs below I discuss these distinctions.

Campbell et al. (1993) define employee performance as individual behaviour that meets three criteria; it must be relevant to organisational goals, under the control of the employee, and it must be able to be measured in terms of each individual’s proficiency. This definition includes a wide range of behaviours. In this thesis I focus on an aspect of performance that Campbell et al. (1990) refer to as job-specific task proficiency. This aspect includes behaviours that are specific to the job of the employee, and that contribute directly to the core productive processes within the employee’s work group. As such, the behaviours tend to be in-role. Job-specific task proficiency is similar to other performance constructs such as task performance (Borman & Motowidlo, 1993; Johnson, 2003), job role behaviour (Wellbourne, Johnson & Erez, 1998), and individual task proficiency (Griffin, Neal & Parker, 2007). In this thesis, I use the term ‘task performance’ to refer to this aspect of in-role task oriented behaviour. Task performance is an important aspect of the employee performance construct, because it represents one of the most direct ways in which an individual can contribute to the effectiveness of their group.

Campbell et al. (1993) distinguish employee performance from effectiveness. Performance is strictly a behavioural construct, representing only what the employee actually does. Effectiveness represents the outcomes or results of performance. One way to evaluate effectiveness is to measure the extent to which an individual has achieved certain goals or outcomes relevant to the group. In the case of a sales employee, for example, effectiveness could be measured by indicators such as the dollar value of sales achieved. Employee performance will normally be an important predictor of individual effectiveness; however effectiveness may also be influenced by situational factors that are beyond the control of the employee. For example, sales effectiveness could be influenced by the territory assigned to a salesperson in addition to employee performance.

Within Campbell et al’s. (1993) model, the determinants of task performance are the proximal factors that contribute to variability in employee performance. In
identifying the determinants of performance, Campbell et al. (1993) drew on cognitive models of skill acquisition (Anderson, 1985; Kanfer & Ackerman, 1989). Such models specify three direct determinants of performance. They are declarative knowledge, procedural knowledge and skill, and motivation. Declarative knowledge is “knowledge about facts and things” (Anderson, 1985, p. 199). It includes basic information that might be covered in textbooks or training courses, as well as expert knowledge that is acquired with experience. While declarative knowledge is necessary for performance, such knowledge must be combined with knowledge of how to perform the task, or procedural knowledge and skill. Procedural knowledge and skill cannot be taught, but must be developed through practice. Finally, motivation is defined as the choice to expend effort in exhibiting a given behaviour. Campbell et al. (1993) argue that task performance is a multiplicative function of declarative knowledge, procedural knowledge and skill, and motivation. Any increase in task performance must be preceded by an increase in one of these three variables.

Finally, the antecedents of performance are factors that might influence the determinants of performance. While there are only three direct determinants of performance, the antecedents of performance are potentially infinite. Factors such as training course design, leader behaviour, general cognitive ability, personality, group size and co-worker behaviour may all influence the determinants of performance. In this chapter, the antecedent of performance that I address is group level extra-role helping.

**Task Facilitation**

I propose that extra-role helping by co-workers can convey information, ideas and strategies that increase an individual’s declarative knowledge, and procedural knowledge and skill. This proposition is consistent with Podskaoff and MacKenzie’s (1997, p. 135) argument that new employees “learn the ropes” when more experienced employees help them, and that helping behaviour “may be the mechanism by which best practices are spread throughout a work unit or group.” In the task facilitation mechanism I take these ideas and develop them as a formal model that can be tested empirically. The overall task facilitation model is shown in figure 3.1, and I describe the propositions underlying the model in the paragraphs below.
Figure 3.1 The task facilitation mechanism

The first three propositions address the relationships between group level helping, individual declarative knowledge and procedural knowledge and skill, individual task performance, and individual effectiveness. I argue that many forms of task-related helping will, in the aggregate, enhance the knowledge and skill of fellow group members. Of course, as Organ (1997, p. 87) points out, not every single act of helping will have a positive effect, but I do expect the average effect of task-related helping to be positive. In the paragraphs below I explain how specific types of task-related helping may be related to group members’ knowledge and skill.

The declarative knowledge of group members will be increased by any form of helping that adds to the individual’s store of knowledge about the task. Van Dyne and LePine (1998, p. 112) nominate “help(ing) others learn about the work” as an important aspect of extra-role helping. For example, a mechanic might be using a tool in a way that is technically poor, and a co-worker could help by describing the correct way of using the tool.

Feedback forms an important part of the process by which procedural knowledge and skill is developed and enhanced (Anderson, 1985). Specifically, feedback provides critical information on the gap between the current level of performance and the goal state. Helping behaviour from fellow group members may
represent an important type of feedback. The fact that group members are providing assistance may indicate to individuals that there are specific ways in which their performance needs to improve. Co-workers who provide help may also suggest specific ways in which the individual could enhance their performance. For example, showing a mechanic the correct way of using a tool, and providing feedback on the mechanic’s subsequent performance should contribute to the development of procedural knowledge and skill.

These increases in declarative knowledge and procedural knowledge and skill should allow the individual to exhibit higher levels of task performance. The higher levels of task performance should then translate into increased individual effectiveness. Consistent with Campbell’s model, however, effectiveness may also be influenced by situational factors beyond the control of the employee (Campbell et al., 1993).

Proposition 1: The extra-role helping behaviour of co-workers will increase the declarative knowledge and procedural knowledge and skill of individual group members.

Proposition 2: An increase in declarative knowledge and procedural knowledge and skill will increase the task performance of individuals.

Proposition 3: An increase in task performance will increase the effectiveness of individuals.

Effect of Task Interdependence

A collection of individuals must exhibit some degree of interdependence before they can be meaningfully regarded as a group (Guzzo & Dickson, 1996). However, groups can differ from one another in the ways in which they are interdependent, and in their level of interdependence. The level of interdependence in a group has been linked to group effectiveness (Stewart & Barrick 2000; Wageman, 1995) and the job attitudes of individual group members (Van Der Vegt & Van De Vliert, 1998). Interdependence has an important role to play in the task facilitation model because it should influence the amount of helping that occurs within the group (Wageman, 1995). Interdependence should also influence the extent to which group helping contributes to the knowledge and skill of individual members. In the paragraphs below I discuss the construct of interdependence in more detail, and then address its role within the task facilitation model.
Task interdependence can be defined as the extent to which members depend on each other in order to accomplish their work (Wageman, 1995). In highly interdependent groups, members complete tasks cooperatively and rely on one another for information, resources and feedback (Stewart & Barrick, 2000). Different groups can develop different levels of interdependence as they establish regular patterns of behaviour and interaction. The level of interdependence within a group can also be affected by external factors, such as the technological requirements inherent in the group’s task. Technological requirements refer to the facilities and equipment that must be used by group members to accomplish the task (Thompson, 1967). For example, a production line requires a degree of interdependence among co-workers, because work must flow sequentially from one individual to another along the line. The level of interdependence required within a production line is relatively low, because members interact only with their adjacent co-worker, and the interaction is limited to simply passing the work along. The technological requirements in different contexts can require higher levels of interdependence. In the cockpit of a passenger airliner, for example, the pilot, co-pilot and flight engineer must coordinate and synchronise their actions in order to perform important functions such as landing the aircraft. They must interact cooperatively as a team, and collectively determine the correct course of action to take in a given situation. The levels of cooperation, feedback and communication are much higher, because the task requires a higher level of interdependence.

Technological requirements are not the only determinant of interdependence within groups. For example, studies of computer-mediated communication in problem solving groups have shown that different groups can establish different levels of interdependence, even though the technological requirements are common across all groups (Hathorn & Ingram, 2002). Studies of production groups (Stewart & Barrick, 2000) and clerical groups (Campion, Medsker & Higgs, 1993) have shown similar variations in interdependence across technologically parallel groups. Factors such as the composition of the group, the instructions provided to the group, and reward contingencies can influence the level of interdependence that is established. For example, emphasising group rather than individual rewards has been shown to correlate positively with feelings of responsibility for the performance of co-workers (Van der Vegt, Emans & Vliert, 1998). To the extent that the technology, the group
norms, and the group goals allow for interdependent behaviour, providing group rather than individual rewards may enhance levels of interdependence.

I propose that interdependence will have two effects within the task facilitation model. First, previous research suggests that interdependence is associated with higher levels of helping within the group. Higher levels of interdependence should result in more communication, more interaction, and more cooperative work among group members. The opportunity to provide and receive acts of helping will therefore be higher in interdependent groups, compared to groups in which members work independently of one another. Wengener (1995) found that helping behaviours occurred more often in groups that were more interdependent. She also found that the extent to which group members learned from each other was higher in more interdependent groups, an effect which could be attributed to the elevated levels of task related helping. The model of task facilitation therefore includes a relationship between group level interdependence and group level helping.

**Proposition 4: Group interdependence will be positively related to group extra-role helping.**

I also propose that group interdependence will affect the relationship between group helping and individual knowledge and skill. Specifically, I expect that group helping will have a stronger and more positive effect on the knowledge and skill of individual group members when interdependence is high. There are two reasons for this proposition. First, under conditions of high interdependence, group members will interact with one another more often in the course of their work. This increased rate of interaction will allow group members to learn more about the strengths and weaknesses of their co-workers. When group members provide help, therefore, they will be able to tailor their help to specifically address any knowledge or skill gaps that co-workers may have. When group members work independently, however, they will be less familiar with the knowledge and skill of their co-workers, and consequently less capable of providing help that effectively develops their co-workers’ knowledge or skill.

The second reason relates to the intentions and motivations for helping. Research suggests that individuals may be motivated by a number of different factors when they exhibit helping; for example, they may help others because they like them, because they are committed to the group, or because they want to ingratiate
themselves with others (Ferris et al., 1995). When the group is highly interdependent, I argue that group members will be motivated to help because they want to enhance the skills and knowledge of their co-workers. When groups are interdependent, group members will realise that their own effectiveness, and the effectiveness of the group as a whole, depends on each member performing effectively. Acts of helping directed towards enhancing the skills and knowledge of co-workers should therefore be more common in more interdependent groups (Wageman, 1995; Johnson & Johnson, 1989). Such helping is more likely to produce a sustained increase in co-worker performance, and is therefore more valuable in more interdependent groups. For example, rather than simply completing a co-worker’s task for them, an individual in a more interdependent group may help by explaining how the task should be done. Both acts represent forms of helping; however helping by explaining should contribute to the task relevant knowledge of the co-worker more than helping by doing the task for them.

*Proposition 5: Group helping and group interdependence will interact such that group helping will have a stronger impact on individual knowledge and skill under conditions of high interdependence.*
CHAPTER 4: A CONCEPTUAL MODEL OF CLIMATE BUILDING

The second mechanism that I investigate is called climate building. I propose that one of the most immediate and direct effects of group level extra-role behaviour will be on the perceptions that individual members have of the climate within the group (i.e. psychological climate; James & Jones, 1974). These individual perceptions are important because they can influence the extent to which group members will remain with and contribute to the group (Griffeth et al., 2001; Griffith, 2006). Psychological climate is also linked to the overall climate of the group (Glick, 1985), and group or organisational level climates have been linked to outcomes such as turnover rates, financial performance, customer satisfaction, and productivity (Carr, Schmidt, Ford & DeShon, 2003; Harter, Schmidt & Hayes, 2002; Ostroff, 1992; Ryan, Schmit & Johnson, 1996; Schneider & Bowen, 1985). One of the ways in which helping and voice might affect group effectiveness, therefore, is by influencing the climate perceptions of individual group members.

In this chapter I first discuss the nature of climate within groups. I then introduce the dimension of climate that I focus on, which is group affective climate (Ostroff, 1993). The climate building mechanism that links group level extra-role behaviour with affective climate is derived from Salancik and Pfeffer’s (1978) theory of social information processing. Before presenting the mechanism itself, I briefly outline this theory and its relevance to the current problem. Finally, I present a model of climate building, and describe the five propositions that form the basis of this model.

**Group Climate**

In this chapter I use the same definition of a work group as that presented in chapter 3. In summary: a work group is a collection of interdependent individuals who are jointly responsible for one or more organisational functions, and are seen by themselves and others within the organisation as a distinct social entity. In this context, climate relates to perceptions that group members have of the work environment within the group. These perceptions can be studied at the individual and the group levels. Psychological climate refers to the perceptions held by an individual (James & Jones, 1974). By contrast, group climate is an emergent property of the
group that can be defined as the shared perceptions that members have of the work environment within the group. Psychological climate and group climate are linked together: the climate perceptions of individual members form the building blocks of group climate, and group climate will simultaneously influence the climate perceptions of individuals (Glick, 1985).

Traditionally, climate researchers have been interested in characterising entire organisations as possessing a particular type of climate (Argyris, 1958). However, research within the last 30 years has increasingly addressed climate as multilevel construct encompassing both organisations and subunits such as work groups (Glick, 1985). Zohar and Luria (2005), for example, showed that the safety climates in work groups were distinct from organisational safety climates across a sample of 401 work groups in 36 different manufacturing organisations. Furthermore, their results showed that the relationship between organisational safety climate and safety behaviour was fully mediated by group safety climate. These results suggest that work groups represent a meaningful unit of theory for the climate construct. In addition to safety climate, researchers have examined many other dimensions or facets of climate at the group level, including procedural justice climate (Naumann & Bennett, 2002), service climate (Schneider, Salvaggio & Subirats, 2002), and alcohol consumption climate (Carson, Barling & Turner, 2007).

In this thesis I focus on what Ostroff (1993) refers to as affective climate, a dimension of climate that relates to the affective tone of work related interactions among group members. Affective climate includes perceptions of interpersonal warmth, cooperation among group members, and participation in group decision making. These factors tend to be moderately to highly correlated with one another (Ostroff, 1993), because they all relate to the affective events and experiences that arise from interactive group work. Ostroff (1993) distinguished the affective dimension of climate from cognitive and instrumental dimensions. The cognitive dimension refers to intellectual involvement in the organisation and the cognitive contribution that employees can make. This dimension includes aspects such as creativity, autonomy and skill development. The instrumental dimension refers to perceptions of work processes, and includes aspects such as organisational structure, hierarchy and extrinsic rewards.

Glick (1985) advises researchers to select climate dimensions that will be most relevant to their research question. I have selected affective climate because I expect
that perceptions of this dimension will be related to the levels of helping and voice exhibited by co-workers. I argue that group levels of helping and voice form important parts of the technical, social and psychological environments in which individual group members work. Furthermore, acts of helping and voice communicate the attitudes that the actors hold towards the group and group members. Helping, for example, is likely to communicate a positive attitude towards group members and the group’s task; while voice may communicate dissatisfaction and negative perceptions of the group. These communicated attitudes provide other group members with information on how they ought to perceive the group, and can therefore influence climate perceptions of group members (Deutch & Gerard, 1958; Salancik and Pfeffer, 1978). In the paragraphs below I present a more detailed exposition of the climate building mechanism, in the context of Salancik and Pfeffer’s theory of social information processing (1978).

**Social Information Processing**

Salancik and Pfeffer (1978) developed their theory of social information processing as an explanatory model of the job attitudes held by individuals (e.g. task variety, job significance). They critiqued previous models which assumed that job attitudes were formed as individuals compared their needs (e.g. for task variety, or job significance) with the objective characteristics of the job (Hackman & Lawler, 1971). Salancik and Pfeffer (1978) argued that such models ignored the social context in which attitudes are formed and expressed. To remedy this shortcoming, they proposed a model that identified three separate processes that could influence an individual’s job attitudes: (1) an environmental perception process in which people form attitudes on the basis of direct experience with relevant aspects of the work environment; (2) a social influence process in which the expressed attitudes of co-workers influence an individual’s own attitudes; and (3) a self-perception process in which an individual’s past behaviour affects the attitudes they subsequently express. I discuss each of these processes in turn.

The first process is an environmental perception process, in which attitudes towards the environment form as a function of the individual’s perceptions of that environment. For example, when people are asked whether they are satisfied with their job, one of the things they will do is examine their job and evaluate the extent to which they experience positive affect while performing job tasks. Strong perceptions
of positive affect will lead relatively directly to more positive job attitudes (Salancik & Pfeffer, 1978). When making these attitude judgements, individuals will consider aspects of the environment that are relevant to the judgements they are making, and that are salient within the environment. In many circumstances, the most salient and relevant aspects of the environment will be the behaviour of other group members. However, a range of other environmental factors may also be relevant, such as the technology within the group, or the physical design of the workplace.

The second process is a social influence process. Salancik and Pfeffer (1978) argued that the task of evaluating aspects of the work environment was inherently ambiguous. For example, there is no objectively correct answer when asked about factors such as the significance of a job, the degree of centralisation in decision making, or the level of morale in a group. Group members are likely to find that their own perceptions of the work environment do not provide enough information to make a judgement. Under these uncertain circumstances, Salancik and Pfeffer (1978) argued that individuals would look to the attitudes expressed by co-workers for information on what constitutes an acceptable and correct set of attitudes to express. In this way, the attitudes of others within the group influence the attitudes of individual members via a social influence process.

Salancik and Pfeffer (1978) argued that group members may obtain information on the attitudes of others in direct or indirect ways. In a direct way, co-workers may make overt statements regarding their attitudes towards the group or the group’s task. For example, they may state that they believe that the job has no significance for them, or that morale in the group is low. Empirical tests of the theory have often used confederates of the researcher to make overt statements of this type, with the expectation that these statements will influence the attitudes of study participants. Such studies have generally supported the SIP model, with specific statements by confederates eliciting job attitudes that accord with the statements, even though the objective characteristics of the work environment remain the same (Schnake & Dumler, 1987).

Attitudes and beliefs may also be communicated by co-workers in an indirect manner. For example, co-workers who smile while working, who leave lunch early to return to their job, and who put in extra-effort to achieve goals, are behaving as if they believe that the job is significant, and that their job satisfaction is high. Such behaviours communicate attitudes in a way that is indirect, but still relevant to co-
workers who may be evaluating the work environment. Indeed, indirect behavioural indicators of attitudes may be even more powerful than verbal statements in influencing others. Verbal statements may be disbelieved, or at least regarded tentatively, until they are confirmed or supported by action. Co-workers who say they love their job, but act as though they dislike it, will be more likely to communicate a negative rather than a positive attitude towards their job.

The final process nominated by Salancik and Pfeffer (1978) was a self-perception process in which the individual’s own past behaviour informs their current attitude judgements. People strive for consistency between their behaviours and their attitudes (Bem, 1972). For example, an individual who works a great deal of overtime may conclude that he or she loves the job, because other attitudes would be inconsistent with past behaviour. The social context also influences this self perception process: If the previous behaviours were witnessed by co-workers, and were exhibited voluntarily, then the motivation to express attitudes consistent with those behaviours is increased. A number of studies have supported the proposition that individuals develop attitudes that are consistent with past behaviour that is performed voluntarily and in public (e.g. Staw, 1974).

In summary, SIP provides a theoretical context for understanding the ways in which the work environment influences an individual’s perceptions of specific factors within that environment. As a general theory, SIP has been applied to domains such as organisational change (Miller & Monge, 1985), group conflict (Hobman, Bordia, Irmer & Chang, 2002), and decisions to file discrimination claims (Goldman, 2001). In the paragraphs below I apply SIP to the judgements that individuals make of group affective climate, as a function of the extra-role behaviours exhibited by co-workers within that environment.

### A Social Information Processing Model of Climate Building

The climate building model that I propose is shown below in figure 4.1. This model links the helping and voice behaviours that occur within the group, with the climate perceptions of individual group members. This model has been changed somewhat from the SIP model originally presented by Salancik and Pfeffer (1978). These changes have been necessary due to the multilevel nature of the climate building mechanism. Salancik and Pfeffer’s (1978) original model was a single level (intra-individual) model that described the relationship between perceptions of the
work environment and subsequent attitude statements. In the proposed climate building model, the aspects of the work environment that are of interest are the aggregate levels of helping and voice behaviours within the group. The proposed model therefore clearly distinguishes between the group level aspects of the work environment, and the individual level processes involved in perceiving this environment.

Figure 4.1: The Climate Building Mechanism*

The first proposition within the model relates group level extra-role helping behaviour with the affective climate perceptions of individual members. I propose that group helping will influence affective climate perceptions in two ways. First, extra-role helping within the group represents a highly salient aspect of the interpersonal and social environment, and will therefore influence affective climate judgements via an environmental perception process. Helping behaviours support and enhance social relationships among group members (Konovsky & Pugh, 1994), and have been associated with positive affect within groups (George & Brief, 1992; Gross & Latane, 1974). Group members who witness more helping behaviours within the group should therefore report more positive perceptions of affective climate. This proposition is
consistent with Podsakoff and MacKenzie’s argument that “a natural by-product of helping behaviour is that is enhances team spirit, morale and cohesiveness” (1997, p. 136).

Extra-role helping will also influence individual climate perceptions through a social influence process. Research into the predictors of extra-role helping shows that group members who exhibit helping tend to have positive perceptions of group climate and morale (Organ & Ryan, 1995). I argue that by exhibiting helping, these group members communicate their positive attitudes to co-workers. An individual who volunteers to help a co-worker tells other group members, indirectly, that he or she believes that the interpersonal relationships within the group are positive – at least positive enough for the help to be provided and received. Helping others can also communicate that the helper is committed to reaching group goals, and ensuring that other group members perform to the best of their ability. Consistent with the SIP model, I propose that when group members are faced with the ambiguous task of evaluating group climate, they will be influenced by the attitudes of others, as communicated by their helping behaviours. Individuals who are exposed to high levels of helping within their group will feel that most other group members hold positive perceptions of affective group climate, and will adjust their own attitudes to match this norm.

This social influence process should operate especially strongly for extra-role behaviours because they are exhibited voluntarily by group members. When a person exhibits behaviour of their own free will, co-workers are likely to interpret the behaviour as reflecting the individual’s true beliefs or feelings (Kelly, 1973). A person who exhibits extra-role helping, therefore, will be regarded as genuinely believing that the group climate is positive, and this should increase the extent to which their communicated attitudes influence the attitudes of others. By contrast, In-role behaviours provide less information on the attitudes and opinions of an individual, because they tend to be exhibited in the same way by all role-holders regardless of what their underlying attitudes are (Organ, 1977).

*Proposition 1: Group level helping will be positively associated with the affective climate perceptions of individual group members.*

Proposition 1 relates to the average main effect of group helping on the attitudes of individual co-workers. However, it may be the case that extra-role helping
will not always be interpreted as communicating positive attitudes towards the group. For example, an individual may believe that group members who exhibit helping are attempting to ingratiate themselves with others. In this case, the helping behaviour would not function as indicator of positive group attitudes, but as an indicator of a self-serving strategy to gain power or rewards. Thus, the motives to which group members attribute extra-role helping will affect the attitudes that are communicated by those behaviours. Individuals who exhibit helping behaviours for self-serving reasons are behaving as if they are only concerned about their own welfare, and not about the welfare of the group or group members. The communicated attitudes are therefore quite negative and Machiavellian. Individuals who exhibit helping behaviours for altruistic reasons, however, are communicating an attitude towards others and the group that is genuinely positive.

Proposition 2: Group helping will interact with the attributions made by individual team members, such that the relationship between group helping and climate perceptions will be weaker, or even negative, when the helping behaviours are attributed to self-serving motives.

The third proposition relates group level extra-role voice behaviour to the affective climate perceptions of individual members. Like helping, voice represents a highly salient aspect of the interpersonal and social environment, and will therefore influence affective climate judgements via an environmental perception process. Arguments for change, especially challenging arguments that run against the opinions of the majority, highlight the differences among group members. Other group members may react defensively to voice behaviours (Van Dyne et al., 1995). The resulting exchanges may produce conflict which generates more negative perceptions of the group (Jehn, 1995). Group members who witness more voice behaviour within the group should therefore report more negative perceptions of affective climate.

Proposition 3: Group level voice will be negatively associated with the affective climate perceptions of individual group members.

I argue that the social influence effects of voice will depend critically on the motivations to which voice behaviour is attributed. Researchers have suggested that voice can stem from feelings of commitment to the group (Fuller et al., 2006), from dissatisfaction with the group (Zhou & George, 2001), and even from fear (Van Dyne et al., 2006).
et al., 2003). Given the range of factors that can motivate voice, the attributed motives are likely to be especially important in determining the attitudes that are communicated.

Voice behaviour, like helping behaviour, will be regarded as discretionary, and will therefore prompt co-workers to attribute the behaviour to either a self-serving motive (e.g. to impress others or benefit the self) or an altruistic motive (e.g. to genuinely benefit the group). I propose that voice that is attributed to self-serving motives will communicate negative perceptions of affective climate. If, however, voice behaviours are attributed to a genuine desire to benefit the group, then the communicated attitudes will be more positive. The people exhibiting voice will be assumed to be committed to the group, and the voice behaviours will therefore be regarded as less threatening.

**Proposition 4:** Group voice will interact with the attributions made by individual team members, such that the relationship between group voice and climate perceptions will be weaker, or even negative, when the voice behaviours are attributed to self-serving motives.

So far I have considered the ways in which group helping and group voice will influence climate perceptions, and the way those effects can be moderated by the attributions that group members make for those behaviours. The attributions themselves, however, are also likely to be influence by aspects of the social environment. One important contextual factor may be the level of task ambiguity within the group. I use the term group task ambiguity to refer to the level of uncertainty or ambiguity regarding group goals, group role structures, and group policies, procedures, and processes. High levels of role ambiguity among group members, for example, would represent an aspect of group task ambiguity (Goldstein, 1997), as would low levels of group goal clarity (Gerard, 1957).

Research on conflict in groups suggests that individuals are more likely to make altruistic attributions for challenging behaviour when there is a high level of task ambiguity within the group (Tidd et al., 2004). Under these circumstances, the expression of different ideas and suggestions may be regarded as a natural by-product of the uncertain environment, rather than a deliberate attempt to gain power or influence. Group members may believe that it is appropriate for individuals to raise new ideas about group direction and strategy in these uncertain circumstances, even
when those ideas conflict with the majority opinion. Indeed, when task ambiguity is high, individuals may believe that the group needs constructive arguments for change in order to manage and reduce the uncertainty. When task ambiguity is low, however, group members will have a clear understanding of what the group is there to do, and how to do it. Group members will perceive little need for voice behaviour, and are likely to regard voice behaviour as a waste of time or a distraction. In the absence of a genuine need for voice behaviour, group members are likely to attribute the behaviour to self interested motives.

Proposition 5: Group task ambiguity will predict individual attributions for voice behaviour, such that self-serving attributions are more likely when group task ambiguity is low.
CHAPTER 5: TASK FACILITATION IN AIR TRAFFIC CONTROL

In this chapter I investigate the task facilitation mechanism in air traffic control. For consistency in this chapter I use the acronym “ATC” to refer to people holding the role of air traffic controller, and the full term “air traffic control” to refer to the task they perform. The role requirements for ATCs relate to the separation and sequencing of air traffic. These role requirements are very specific and very strongly enforced. Within the air traffic control environment, therefore, the distinction between in-role behaviour and extra-role behaviour is very clear. This feature makes air traffic control an excellent context for the study of extra-role behaviours.

Consistent with the task facilitation mechanism, I hypothesise that high levels of extra-role helping within a group of ATCs will be associated with increased task performance by the ATCs in that group. This increase in task performance should allow the ATCs to achieve higher levels of individual effectiveness. I examine these relationships in two different air traffic control environments: enroute air traffic control and tower air traffic control. In both of these environments individual ATCs separate and sequence aircraft as they move from one point to another. The environments differ in the way the task is designed. In towers, air traffic controllers are required to coordinate with one another to manage the movement of aircraft from the gates at the terminal to the runways and back again, along a restricted set of taxiways. The ATCs work together in a common space, and can see and speak with all of the other ATCs in the tower at the time. In enroute air traffic control, however, ATCs work alone at computer terminals and the task is structured so that each ATC can operate relatively independently of other group members. I argue that these differing technological requirements will introduce differences in task interdependence, with ATCs in towers exhibiting higher levels of interdependence than ATCs in enroute groups. Given these differences, I hypothesise that helping will have a stronger impact on task performance and effectiveness in the tower environment.

The rest of this chapter is structured as follows. First, I describe the job of air traffic control, including the nature of effectiveness, in-role behaviour, extra-role helping and task interdependence. Having established the study context, I then present
a series of hypotheses, drawn from the conceptual model of task facilitation presented in chapter 3. Finally, I present the results, and then the discussion.

The Air Traffic Control Environment

ATCs regulate the speed, direction, and altitude of aircraft within air sectors, and on the ground at airports, in order to separate and sequence air traffic. Each ATC has sole responsibility for aircraft in a specific area. For example, an ATC may be responsible for aircraft within an air sector that forms part of the route from one airport to another, or an ATC may be responsible for traffic approaching a particular airport, or on the taxiways at a particular airport. This strict demarcation of responsibilities is intended to ensure that there is never any uncertainty about which aircraft are being controlled by which ATC.

In-Role and Extra-Role Behaviour

The formal ATC role includes all of the cognitive and behavioural tasks exhibited by ATCs in order to separate and sequence the traffic under their control. These in-role requirements have been documented in a number of detailed task analyses and operational manuals (Kallus, Barbarino, & Van Damme, 1998; Wickens, Mayor & McGee, 1997). In-role behaviour includes maintaining situation awareness, issuing instructions to aircraft, using control facilities such as radar, and passing operational information to aircraft, other ATCs, and other agencies (e.g. Search and Rescue). In Australia, the role requirements for air traffic controllers are specified in the *Civil Air Traffic Services Operations Administration Manual (CATSOAM)* (Civil Aviation Safety Authority, 1999). This manual includes detailed procedures and standards that define the way in which aircraft should be separated and sequenced. Communication protocols in this manual define the way in which ATCs should communicate with other ATCs and pilots. The manual also defines the way in which ATCs should interact with the facilities and tools available to them such as communication equipment and radar.

The role requirements in *CATSOAM* are expressed as a set of required task behaviours, referred to as elements of performance, within the *ATC Performance Assessment Assessor Reference Handbook* (Airservices Australia, 1999). Many of the elements of performance are common across both tower and enroute groups, however
some elements are specific to one group or the other. In total, the *Assessor Reference Handbook* defines 34 elements of performance for enroute ATCs and 33 elements of performance for tower ATCs. Thirty of these elements of performance are shared between the two environments. For each element of performance, the manual includes a description of the level of performance an ATC must achieve in order to gain or maintain a license to control traffic. Each ATC’s performance is evaluated with regard to this standard at least once every six months. If an ATC does not meet the minimum level of performance required, then automatic administrative responses apply. For example, the ATC could be stood down, required to take remedial training, or lose his or her license.

Outside of these task requirements, controllers also exhibit a range of more discretionary extra-role behaviours. In their task analysis, Neal, Griffin, Neale, Bamford and Boag (1998) identified nine types of extra-role behaviour that were exhibited by ATCs in both tower and enroute environments. Among them were a number of behaviours that fall within the domain of helping, as defined within the current study. These helping behaviours were: maintaining an awareness of the workload of co-workers, helping co-workers when asked, anticipating a co-worker’s need for help, providing constructive feedback, and acting as a mentor to other ATCs, and cooperating with other ATCs.

Although ATCs were observed to exhibit these extra-role behaviours, they were not formal parts of the ATC role, nor were they assessed by supervisors as part of the licensing process for ATCs. As a result, no minimum standards for the extra-role behaviours existed, nor were they subject to any formal administrative procedures in the way that in-role behaviours were. Rather, ATCs were free to exhibit or withhold the extra-role behaviours at the own discretion.

*Effectiveness in Air Traffic Control*

A number of indices can be used to measure the effectiveness of ATCs and the overall air traffic control system. The outcome that I assess in this thesis is the efficiency of air traffic. An efficient flow of traffic is one in which airspace and runway use is maximised and flight time is minimised. In other words, ensuring that as many aircraft as possible safely traverse the airspace in the least amount of time. The efficiency of air traffic can be measured at different levels. For example, one could assess the efficiency of the traffic flow for all aircraft on all routes within a
single day. Alternatively the efficiency of the traffic on a particular route could be measured. In this thesis, I measured the average efficiency of the traffic that was under the control of a specific ATC. Thus, the efficiency measure used is an individual level measure.

The capacity to measure effectiveness at the level of the individual makes air traffic control different from many other jobs, in which effectiveness measures are more meaningful at group rather than individual levels. For example, Podsakoff et al. (1997) studied the extra-role behaviours of machine crews in a paper mill. The effectiveness measure of interest was the quantity and quality of paper produced by each crew. Such measures are meaningless at the level of the individual, because individuals work together on a single production machine. Within the current study, however, each ATC works in his or her own sector or area of responsibility. While there are dependencies among ATCs within a group, it is possible to isolate aircraft that are under the control of a single ATC, and measure the efficiency of that traffic only.

The efficiency of air traffic depends critically on the judgements, decisions and strategies of individual controllers. The level of efficiency achieved by an ATC, however, will also depend on a range of factors beyond the control of the ATC. Factors such as the actions of pilots, the weather, the actions of other ATCs and unpredictable events such as runway closures will all affect traffic efficiency. Two ATCs could therefore exhibit the same level of performance, but have traffic with different levels of efficiency, due to these external situational factors. Many of these situational factors are associated with the functional group in which the ATC works. Some towers, for example, are busier than others, and some enroute groups have more complex route structures than others. Within this study, I control for between group differences in traffic volume and route complexity.

Task Interdependence in Air Traffic Control

The air traffic control task is designed quite differently in the enroute and tower environments. I expect that these technological differences will influence the level of task interdependence in these different types of groups. Specifically, I expect that tower ATCs will exhibit higher levels of interdependence than enroute ATCs. In the paragraphs below I explain the differences between the tower and enroute
environments in more detail, and the effects that these differences should have on task interdependence.

The primary function of ATCs in tower groups is to control the flow of traffic on the ground at airports, on taxiways and runways. They give the final clearance for aircraft to land, and hand-off aircraft to controllers in other groups once the aircraft are airborne. ATCs in towers work alongside each other in a common physical space. ATCs in towers, therefore, can see each other, speak directly to one another, and interact with one another in person. ATCs in enroute groups work in a different environment. Each enroute group consists of a set of contiguous air sectors traversed by aircraft flying from one destination to another. Each sector is staffed by a single ATC who works alone at a computer terminal that displays an overhead view of the aircraft within his or her sector. Operational interaction with other ATCs occurs only when an aircraft approaches a sector boundary. This communication is limited, and will occur through radio contact, or through other electronic means.

Thompson’s (1967) taxonomy can be used to describe the technological requirements of the tower and enroute air traffic control tasks. This taxonomy distinguishes between pooled, sequential and reciprocal task designs. Sequential tasks require a higher level of interdependence than pooled tasks, and reciprocal tasks require a higher level of interdependence than sequential tasks. Table 5.1 describes the extent to which each of these different task designs is descriptive of tower and enroute air traffic control. As shown in the table, the task in enroute air traffic control closely resembles sequential interdependence, while the task in tower air traffic control most closely resembles reciprocal interdependence.

The lowest level of interdependence is pooled interdependence, in which all group members have the same role, and work independently of one another. Pooled interdependence is not strongly descriptive of either enroute or tower air traffic control. In enroute groups, ATCs must exhibit a degree of interdependence because aircraft are passed from one ATC to another along the route. In towers, ATCs must work with all of the other ATCs in the tower to coordinate and solve traffic problems. This interaction introduces dependencies among the ATCs within the group that are incompatible with pooled interdependence.

The second level of interdependence is sequential interdependence, in which work progresses from one member to another, as in a production line. Sequential interdependence is descriptive of enroute air traffic control, because each aircraft is
passed from controller to controller in a set sequence defined by the aircraft’s route. ATCs are responsible for aircraft within their own sector, and work to solve traffic problems within that sector. Communication between ATCs mostly occurs when an aircraft is crossing from one sector into the next. Enroute air traffic control is not classically sequential, however, as aircraft do not flow in a single direction through the group. Rather, aircraft can traverse a sector ‘both ways’, from the ATC to his or her neighbours and from the neighbours to the ATC. Aside from this factor, however, the task is sequential in nature.

Table 5.1: Task design in enroute and tower air traffic control.

<table>
<thead>
<tr>
<th>Task Design</th>
<th>Enroute</th>
<th>Tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pooled</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Sequential</td>
<td>Aircraft traverse air sectors within the group in sequence. Each ATC communicates only with neighbouring ATCs. Most ATC to ATC communication occurs when aircraft cross sector boundaries. Solving traffic problems routinely involves a single ATC working within their sector.</td>
<td>-</td>
</tr>
<tr>
<td>3. Reciprocal</td>
<td>Each ATC’s performance is influenced by neighbouring ATCs, and traffic can flow ‘both ways’ from the ATC to his or her neighbours, and from the neighbours to the ATC.</td>
<td>ATCs need to coordinate with one another to solve traffic problems. Each ATC’s performance is influenced by all the other ATCs in the tower. Solving traffic problems routinely involves multiple ATCs within the tower working together.</td>
</tr>
</tbody>
</table>
The highest level of interdependence is reciprocal interdependence, in which group members work collaboratively and each member interacts with a number of other members in the group, rather than just their neighbours. Reciprocal interdependence is strongly descriptive of tower air traffic control. The ATCs must work together as a group to ensure that aircraft move efficiently between runways and terminals through a restricted set of taxiways. The flow of aircraft leaving the airport must be coordinated with the flow of aircraft coming into the airport. Thus, controllers responsible for aircraft that are about to land must coordinate runway space with controllers responsible for aircraft that are taking off. Similarly, controllers responsible for aircraft at the terminals must be aware of the number and type of aircraft that are landing. ATC operations in the tower, therefore, must be highly synchronised.

**Group Level Helping in Air Traffic Control**

The ATCs in the current study were organised for operational purposes into functional groups, usually consisting of 15-25 ATCs. Each enroute group was responsible for a set of adjoining air sectors, while each tower group was responsible for aircraft within or approaching a particular airport. Functional groups were the main organising structure within the organisation. ATCs within a functional group reported to a common set of supervisors, and each functional group was led by an overall manager.

Functional groups formed the local work group for each ATC, and ATCs would interact with other members of their functional group on each shift. I anticipated that attraction-selection-attrition and normative processes would result in functional groups developing and maintaining a common level of helping behaviour (George & Bettenhausen, 1990). I therefore used a direct consensus composition model in forming group level averages of helping behaviour (Chan, 1998). Aggregation statistics supported the formation of group averages, and I report these in the results section.
Hypotheses

So far I have argued that in-role behaviour can be distinguished from extra-role helping within air traffic control, and that both of these constructs can be distinguished from effectiveness, as indicated by traffic efficiency. I have also introduced two different air traffic control environments that should differ in their level of interdependence: tower groups and enroute groups. In this section, I bring these different variables together in the form of specific hypotheses.

First, I argue that the differences in technological factors and task design between the tower and enroute groups will affect the behaviour that ATCs in those groups exhibit. Because ATCs in the tower work in a common space, can see and speak with one another easily, and are required by the task to be more cooperative, I expect that they will exhibit higher levels of helping than ATCs in enroute groups. I do not expect that helping will be absent in enroute groups. For example, ATCs can still assist one another by sharing expertise and task related knowledge during non-operational times. However, the capacity to do so while actually ‘plugged in’ and controlling traffic in the enroute environment will be limited.

_Hypothesis 1: ATCs in tower groups will exhibit more helping than ATCs in enroute groups._

An important part of ATC helping is contributing to the knowledge and skill of other ATCs within the group. This may be done by conveying information that builds the declarative knowledge of ATCs. For example, helping may convey information on aircraft performance characteristics, ideas on how to resolve traffic difficulties in sector “hot spots”, suggestions on how to interact with facilities such as radar, or advice on how to interact with foreign pilots. Helping behaviours may also contribute to the procedural knowledge and skill of ATCs. Procedural knowledge and skill represents knowing how to control traffic, rather than simply knowing a set of facts about sectors, aircraft, separation standards, and so on. Procedural knowledge and skill is gained through practice, however there are some helping behaviours that can facilitate the development of procedural knowledge and skill. Providing feedback is one example, as feedback on performance is an important contributor to skill growth (Kanfer & Ackerman, 1989). ATCs who work in functional groups in which helping behaviour is exhibited more often, therefore, should have higher levels of
declarative knowledge and procedural skill, and should therefore exhibit higher levels of task performance.

Hypothesis 2: Group level extra-role helping will be positively associated with ATC task performance.

I expect that ATCs will be able to provide more effective helping behaviour in groups that are more interdependent (tower groups), compared to groups in which ATCs operate independently (enroute groups). ATCs in interdependent groups will learn more about each other’s levels of skill and knowledge, and will be able to provide task relevant assistance that is targeted towards the specific needs of other controllers within the group. Furthermore, a high level of interdependence introduces dependencies among ATCs, such that individual effectiveness depends on the performance of other ATCs in the group. For this reason, ATCs may be more motivated to provide effective assistance that enhances knowledge and skill in more interdependent groups.

Hypothesis 3: The relationship between group extra-role helping and individual task performance will be stronger in the tower environment, compared to the enroute environment.

The level of helping within a group should also be associated with effectiveness of individual ATCs, in terms of the efficiency of the traffic under their control. Maximising traffic efficiency is a complex task that depends on a high level of knowledge about the characteristics of specific airports and sectors, such as route structures, busy times, and the overall pattern of traffic. In order to maximise traffic efficiency, while also maintain safety, ATCs depend on high level traffic management skills, grounded in a firm knowledge of the sector or airport in which they work. This knowledge has to be constantly refreshed every time an ATC moves to a new sector, or every time a change occurs to the route structures within a sector. As a result, I propose that group level helping will be associated with air traffic efficiency, as well as task performance.

Hypothesis 4: Group level extra-role helping will be positively associated with the level of traffic efficiency achieved by an ATC.
Should hypotheses 1 and 3 be upheld, it would then be appropriate to conduct tests for mediation. I would expect that the relationship between group helping and individual traffic efficiency would be mediated by the task performance of the ATC. Mediation can be tested in multilevel studies using the same logic that applies to single level ordinary least squares regression (Griffin, Mathieu & Jacobs, 2001). Specifically, one would need to show that the effect of group level helping on effectiveness was no longer significant once individual task performance was included within the model. Such a finding would indicate that individual task performance accounts for the variance that is shared between group helping and individual effectiveness.

_Hypothesis 5: Individual task performance will mediate the relationship between group level helping and individual traffic efficiency._

**Method**

The current study was completed as part of an ongoing project intended to produce a model of performance for air traffic control. In order to collect data for this model, measures of extra-role helping, traffic volume, traffic complexity and traffic efficiency were provided to the supervisors of all Australian ATCs. These measures were completed by supervisors at the same time as they completed the formal evaluation of each ATC’s task performance for licensing purposes. The analysis presented in this thesis represents the first time that the data arising from this project has been published.

**Participants**

Performance data were collected for all Australian ATCs in 45 functional groups, 25 of which were tower groups while the remaining ATCs were in enroute groups. In total, data were available for 1086 ATCs. Group size ranged from 4 to 63 ATCs, the average group size was 22.26 (SD = 13.78) and the median group size was 22. Controller experience ranged from six months as a fully licensed and endorsed ATC to over 20 years. The ATCs ranged in age from 24 to 59 years old. Males accounted for 94% of the ATCs.
Measures and procedure

Performance ratings were collected from the ATC’s supervisors as part of the regular process of performance evaluation within the organisation. In total, 127 supervisors provided performance ratings across the 45 groups. Most groups had 2-3 supervisors providing ratings, however there were 3 groups that had only one supervisor. Performance evaluations were conducted with reference to the ATC’s performance over the previous six month period. Supervisors were in daily contact with the ATCs that reported to them, and were required to observe all aspects of task performance over that six month period. Supervisors observed performance by working alongside the ATCs, and by ‘plugging in’ next to each ATC, so they could see and hear the same information as the ATC, while observing them in the role.

Task performance was measured by seven items obtained from the ATC Performance Assessment Assessor Reference Handbook (Airservices Australia, 1999). These seven items were common across the tower and enroute groups, and assessed the proficiency with which ATCs maintained their situation awareness and executed control actions. An example item is shown in table 5.2 below, and the complete set of items is shown in appendix A. The items for task performance used a seven-point ratings scale, where 1 represented the worst possible performance that a controller could be expected to show, 4 represented the minimum level of performance required to receive or maintain a license, and 7 represented the best possible performance that an expert could be expected to show for that particular task. Detailed behavioural anchors were provided for these points. The internal reliability of the scale was 0.95.
Table 5.2: Example item from the measure of ATC task performance.

<table>
<thead>
<tr>
<th>Performance Criteria for “Scanning”</th>
<th>1</th>
<th>4</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Missed critical information (suffered from tunnel vision).</td>
<td>a) Never missed critical information.</td>
<td>a) Never missed critical information.</td>
<td></td>
</tr>
<tr>
<td>b) Suffered from frequent information overload.</td>
<td>b) May have occasionally suffered from information overload.</td>
<td>b) Did not suffer from information overload.</td>
<td></td>
</tr>
<tr>
<td>c) Did not adjust rate of scanning to accommodate workload.</td>
<td>c) May not always have adjusted scanning to accommodate workload.</td>
<td>c) Always adjusted rate of scanning to accommodate workload.</td>
<td></td>
</tr>
<tr>
<td>d) Was always able to safely recover from b) &amp; c).</td>
<td>d) Was able to attend to multiple sources of information (including information from other ATC elements and sectors).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extra-role helping was assessed by three items assessing the extent to which the ATC provided assistance to other ATCs in their group, provided feedback to other ATCs in the group, and cooperated with other ATCs in the group. Items were obtained from the task analysis of ATC performance conducted by Neal et al. (1998) which identified specific acts of helping that went beyond the formal ATC role. An example item is shown in table 5.3 below, and the full set of items is shown in appendix A. Each item was assessed on a seven point rating scale, where 1 indicated a poor level of the behaviour, 4 an adequate level, and 7 a desirable level. Detailed behavioural anchors were provided for these points. The internal reliability of the scale was 0.90.
Table 5.3: Example item from the measure of ATC helping.

<table>
<thead>
<tr>
<th>Performance Criteria for “Providing assistance”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>b) Provided inappropriate responses when a co-worker required assistance.</td>
</tr>
</tbody>
</table>

Efficiency was rated by three items addressing the flow of traffic through the sector or area being controlled by the ATC. The items addressed factors such as the time taken by aircraft to move from point to point, the number of disruptions to traffic flow that occurred, and the extent to which airspace routes and landing facilities were used to capacity. The items were obtained from the task analysis of ATC performance conducted by Neal et al. (1998). An example item was “Did the configuration of aircraft tracks and levels maximise the use of airspace and/or landing facilities”. The full set of items is shown in appendix A. Each item was rated on a seven point scale, where 1 indicated the lowest level of efficiency that was possible for the sector, 4 represented the average level of efficiency, and 7 the highest possible level of efficiency. The internal reliability of the scale was 0.89.

Control Variables. I also included in the analysis ratings of two situational factors: traffic volume and traffic complexity. Traffic volume was assessed by a single seven point scale, which assessed the volume of aircraft that were flowing through the ATC’s functional group over the past six months. Traffic complexity was assessed by a single seven point scale, which assessed the complexity of the traffic and the route structures within the functional group. Traffic complexity and traffic volume are important control variables, as they may influence both the task performance of ATCs, and the level of effectiveness they achieve. I expected traffic volume and
complexity to be correlated, because sectors that have higher volumes of traffic also
tend to have more complex route structures. Finally, the size of each functional group,
and the tenure of each ATC was obtained from organisational records.

Assessment of discriminant validity

The measures of task performance, extra-role helping, traffic efficiency, traffic
volume and traffic complexity were all drawn from the one source, which was the
supervisor. As such it is necessary to demonstrate that supervisors were distinguishing
between these different aspects of performance, effectiveness and external situational
factors when they were making ratings. This was done by conducting a principle
components analysis on the individual level data from all ATCs. Oblimin rotation was
used, as the factors were expected to be correlated. As shown in table 5.4, the items
addressing task performance, extra-role behaviour, efficiency and situational factors
(volume and complexity) loaded uniquely on four distinct components with
eigenvalues greater than one. As expected, correlations among the task performance,
extra-role helping and efficiency factors were moderate, ranging from 0.38 (efficiency
and extra-role behaviour) to 0.64 (task performance and extra-role helping). The
situational factors component had low correlations with the other components.
Overall, these results support the discriminant validity of the measures used.

Analysis Strategy

I used hierarchical linear modelling (HLM) to test the hypotheses in this study.
HLM is a multi level technique that allows researchers to simultaneously assess the
effects of both group level and individual level variables on an individual level
outcome of interest. HLM can be conceptualised as analysing the impact of each
predictor variable on within group variation in the outcome of interest (e.g. the extent
to which ATCs differ from other ATCs in their group) and between group variation in
the outcome of interest (e.g. the extent to which groups of ATCs differ from one
another). Each predictor variable entered into the model could account for a portion of
within group variance, if it varies systematically within groups, and a proportion of
between group variance, if it varies systematically between groups.
Table 5.4: Principle Components Analysis of Variables from Study 1.

<table>
<thead>
<tr>
<th>Component</th>
<th>Task performance</th>
<th>Situational Factors</th>
<th>Efficiency</th>
<th>Extra-Role Helping</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% variance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 1</td>
<td>0.90</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Task 2</td>
<td>0.90</td>
<td>-0.02</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Task 3</td>
<td>0.90</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Task 4</td>
<td>0.89</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Task 5</td>
<td>0.89</td>
<td>-0.01</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Task 6</td>
<td>0.89</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>Task 7</td>
<td>0.83</td>
<td>0.00</td>
<td>0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>Volume</td>
<td>0.00</td>
<td>0.95</td>
<td>0.03</td>
<td>-0.02</td>
</tr>
<tr>
<td>Complexity</td>
<td>-0.01</td>
<td>0.94</td>
<td>-0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Efficiency 1</td>
<td>-0.06</td>
<td>0.00</td>
<td>0.94</td>
<td>0.00</td>
</tr>
<tr>
<td>Efficiency 2</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.91</td>
<td>-0.01</td>
</tr>
<tr>
<td>Efficiency 3</td>
<td>0.09</td>
<td>0.03</td>
<td>0.86</td>
<td>0.02</td>
</tr>
<tr>
<td>Helping 1</td>
<td>-0.09</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.97</td>
</tr>
<tr>
<td>Helping 2</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>0.90</td>
</tr>
<tr>
<td>Helping 3</td>
<td>0.13</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.83</td>
</tr>
</tbody>
</table>

N = 1086.

Loadings greater than 0.30 are shown in bold type.

Some predictor variables, such as group size, will only be able to account for between group variance in the outcome because they are constant for all members of the same group. Many predictor variables, however, will explain both within group and between group variance in the outcome of interest. HLM estimates the amount of residual variance at both levels, and so the proportion of within and between group variance accounted for by each predictor can be quantified.

In this study, extra-role helping is the primary predictor of interest. It is represented in the prediction equation by two variables – an individual level variable and a group level variable. The individual level variable carries all the information about each ATC’s level of helping. The group level variable carries all the
information about how groups of ATCs differ from one another in their average level of helping. The individual and group level helping variables will be correlated with one another, because the individual ATC’s own level of helping forms part of the group level aggregate. However, the group level helping variable also contains variance due to the level of helping exhibited by all other ATCs within the individual’s group, and for this reason, the group level variable will not be perfectly correlated with the individual level variable. If the group level helping variable accounts for variation in the dependent measure, over and above the effects of the individual level helping variable, then one can say that the dependent measure is influenced not only by the ATC’s own level of helping, but also by the extent of helping exhibited by co-workers within the ATC’s group. Because HLM examines both within group and between group variance simultaneously, the influence of the group’s level of helping represents a conditional effect that is corrected for each ATC’s individual level of helping.

The individual level variable was grand mean centred prior to analysis by subtracting the overall mean level of helping from each ATC’s score (Hoffman & Gavin, 1998). As Raudenbush and Bryk (2002) note, grand mean centring the individual level variable means that any relationship between group level helping and the dependent measure can be interpreted as the effect that would be observed for an ATC exhibiting an average level of helping at the individual level.

In order to test the hypotheses I conducted the analysis in a series of steps. I started with a null model in which no predictors other than a constant were entered. This null model provides a baseline against which the other models can be evaluated, as the predictor variable (being a constant) cannot account for any variance in the dependent variable. Each predictor that is added to the model from this initial step can be evaluated by examining the extent to which it accounts for within-group and between-group variance in the dependent variable. After estimating the null model, I then added control variables and explanatory variables in a series of subsequent steps.

The individual level portion of each model was specified as a random coefficient model, so the nature of the within group relationships could vary randomly between groups. What this means is that the model places no restrictions on the within group relationship (if any) between individual level helping and the dependent variable. Given the research showing that extra-role behaviour and task performance are often correlated at the individual level (e.g. Van Dyne & LePine 1998), and given
Effects of co-workers’ extra-role behaviour

the possibility that these relationships may vary from group to group, the random coefficient model was deemed to be appropriate.

Results

A correlation matrix of all the individual level variables in the study, along with means and standard deviations, is shown in table 5.5. The performance factors and efficiency were all inter-correlated at the individual level. In addition, controllers with greater tenure tended to perform better and exhibit higher levels of helping. ATCs in the tower tended to exhibit slightly lower levels of performance than controllers in enroute sectors. Group size was significantly correlated with tower status, with enroute groups being larger on average than tower groups. This highlights the importance of using group size as a control factor in the subsequent analyses.

It is interesting to note that there was no relationship between the ATC environment (tower or enroute) and the amount of helping behaviour exhibited by ATCs; controllers in the tower seemed to help one another just as much as controllers in the enroute environment. As such, any differences between the two environments cannot be attributed to the amount of helping that occurs across the two environments.

Table 5.5: Means, Standard Deviations and Correlations for Study 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tenure</td>
<td>18.3</td>
<td>9.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Group size</td>
<td>32.1</td>
<td>14.4</td>
<td>-.04</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Traffic Volume</td>
<td>4.15</td>
<td>.77</td>
<td>.02</td>
<td>.06'</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Traffic Complexity</td>
<td>3.96</td>
<td>.96</td>
<td>.09'</td>
<td>-.08'</td>
<td>.74'</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Task performance</td>
<td>6.01</td>
<td>.69</td>
<td>.27'</td>
<td>-.03</td>
<td>-.07'</td>
<td>-.06</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Helping</td>
<td>6.03</td>
<td>.74</td>
<td>.19'</td>
<td>.02</td>
<td>.00</td>
<td>-.00</td>
<td>.48'</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Efficiency</td>
<td>5.76</td>
<td>.72</td>
<td>.11'</td>
<td>-.05</td>
<td>-.10'</td>
<td>-.19'</td>
<td>.64'</td>
<td>.35'</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8. Tower¹</td>
<td>.36</td>
<td>.48</td>
<td>.06'</td>
<td>-.45'</td>
<td>-.02</td>
<td>.11'</td>
<td>-.09'</td>
<td>-.04</td>
<td>-.04</td>
<td>-</td>
</tr>
</tbody>
</table>

*p<.05

¹Tower controllers were coded “1”, controllers in enroute groups were coded “0”.

N = 1086.
Aggregation of helping to the group level

Before testing the hypotheses it is first necessary to establish that there is a degree of within group homogeneity and between group heterogeneity in the measures of helping. I used the $r_{wg(j)}$ and ICC(1) statistics to evaluate the way in which helping varied as a function of group membership. I also used the ICC(2) statistic to demonstrate the reliability of the group-level aggregates.

The $r_{wg(j)}$ statistic relates to the interchangeability of group members, and assesses the extent to which individual group members exhibit essentially the same level of extra-role helping (Kozlowski & Hattrup, 1992). The statistic is calculated for each group by comparing the observed level of agreement among group members with the level of agreement that would be expected if group members behaved randomly. In this study, random behaviour was modelled as a uniform distribution in which all levels of the behaviour have an equal probability of being exhibited by an individual. While this uniform distribution may not be a realistic model of random behaviour, it is the model that is most commonly used in previous research. Using this distribution therefore allows the $r_{wg(j)}$ values obtained in this study to be compared with the values obtained in previous research. If complete agreement is apparent, and all the members of the group behave in exactly the same way, then the statistic is equal to 1.00 for that group. If the level of agreement within a group is the same as would be expected for random behaviour, then the statistic equals zero for that group.

Although there is no agreed on criterion for the $r_{wg(j)}$ statistic, a level of 0.70 has been suggested by some authors (e.g. Judge & Bono, 2000). This suggestion may have met with broad acceptance because it accords with the 0.70 rule that Nunnally (1978) suggested for reliability statistics, even though the $r_{wg(j)}$ statistic itself cannot be regarded as a form of reliability (Kozlowski & Hattrup, 1992). The average $r_{wg(j)}$ for helping was 0.63 in tower groups, and 0.60 in enroute groups. Sixty-four percent of tower groups and 55 percent of enroute groups attained an $r_{wg(j)}$ that was greater than 0.7. These statistics indicate that there was some agreement in the ratings of helping within groups. The levels of $r_{wg(j)}$ reported are, however, slightly lower than some of the previous studies have reported (e.g. Koys, 2001). These findings suggest that the ATC environment may have groups that are weaker at maintaining common levels of extra-role helping.

ICC(1) is the ratio of between group variation to total variation on a particular measure. An ICC(1) of 1.00 indicates that all of the variation in the measure can be
explained by group membership. An ICC(1) of 0.00 indicates that there is no meaningful variation between groups. ICC(1) can be evaluated for statistical significance, and a result that is significantly different from zero indicates that at least a portion of the variance in the variable differs reliably as a function of group membership. Statistical significance on ICC(1) is usually regarded as a prerequisite for aggregation, and the magnitude of ICC(1) provides an indication of the potential explanatory power of the variable at the group level. If very little of the variance is between groups, then the capacity of the variable to explain between group differences is similarly limited.

The ICC(1) for helping was 0.19 for tower groups, and 0.15 for enroute groups. In both cases, the between group variation was significantly different from zero. Bliese (2000) reports that the median value of ICC(1) within the organisational behaviour literature is 0.12, thus there appears to be a moderate level of agreement with regard to helping. In combination with the $r_{wg(j)}$ results, this suggests that there is a portion of the variance in helping that varies systemically between groups, however, the majority of the variance is within groups. While this does not invalidate the use of helping as a group level variable, it does suggest that the impact of group level helping on task performance and effectiveness may be relatively weak.

Finally, ICC(2) indicates the reliability of the group means that have been computed by averaging the helping ratings for each group member (Bliese). Once the aggregation of helping to the group level has been justified by the ICC(1) and $r_{wg(j)}$ statistics, it is then appropriate to ask whether those group level aggregates provide a reliable measure of the group level construct. Reliability of the group level aggregate is distinct from the reliability of the scale, as might be estimated by cronbach’s $\alpha$, however low $\alpha$ reliability at the individual level will generally lead to lower levels of reliability for the group level aggregate (Bliese, 2000). ICC(2) can be calculated from ICC(1) by including an adjustment for group sample size, and ICC(2) will increase with the number of group members sampled. As the different groups had different sizes in this study, ICC(2) was calculated separately for each group, and then the overall average ICC(2) was calculated (see Raudenbush & Bryk, 2002, p. 71). The average ICC(2) for helping in the tower was 0.75, the average ICC(2) for helping in enroute groups was 0.84.
Tests of hypotheses

Hypotheses 1 related to the levels of helping exhibited in the enroute and tower environments. The correlation matrix in table 5.5 shows that there was no correlation between being in the tower and exhibiting helping, and mean levels of helping in the tower and in enroute sectors differed by only 0.03 scale points. These results do not support hypothesis 1.

HLM was used to test the remaining hypotheses, as detailed in the Analysis Strategy section above. Hypotheses 2 and 3 concerned the relationships between group level helping and individual task performance in the tower and enroute environments. Results for these hypotheses are shown in table 5.6. At each step I report the raw parameter estimates for each predictor; these effects can be interpreted in a similar way to unstandardised regression weights in ordinary least squares regression. I also report the proportion of within group and between group variance explained at each step. As predictors are added to the equation the residual variance may decrease, if the predictor variables explain between group and within group variance in the dependent measure. The proportionate drop in unexplained variance can be interpreted in a similar way to $R^2$ values in ordinary least squares regression.

At step 1 I estimated a null model, with no predictors other than a constant. Because no predictors are entered, the residual between group and within group variance represent the full amount of variance in individual task performance at those levels. The results showed that 12.5% of the variance in task performance could be associated with the group to which the ATC belonged. This portion of variance was statistically significant. Thus, group level helping can potentially explain up to 12.5% of the variance in individual controller task performance.
Table 5.6: Parameter estimates for predicting ATC task performance.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Parameter Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td>Constant</td>
<td>6.02</td>
</tr>
<tr>
<td>ATC tenure</td>
<td>0.26</td>
</tr>
<tr>
<td>Group size</td>
<td>-0.01</td>
</tr>
<tr>
<td>Group traffic complexity</td>
<td>-0.11</td>
</tr>
<tr>
<td>Group traffic volume</td>
<td>0.02</td>
</tr>
<tr>
<td>Tower (0 = enroute, 1 = tower)</td>
<td>-0.16</td>
</tr>
<tr>
<td>Individual helping</td>
<td>0.37</td>
</tr>
<tr>
<td>Group helping</td>
<td>0.28</td>
</tr>
<tr>
<td>Group helping by tower interaction</td>
<td></td>
</tr>
<tr>
<td>Variance modelled between</td>
<td>0.0%</td>
</tr>
<tr>
<td>Variance modelled within</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

*p < .05

N = 1086 individuals, 45 groups.

At step 2 I entered the control variables of tenure, group size, group traffic complexity, group traffic volume, and tower status. The only significant predictor of performance was tenure, although traffic complexity had a negative effect that approached significance, as did tower status. Together these five control variables accounted for none of the between group variance, and 11.9% of the within group variance.

At step 3 I added the effects of individual and group level helping. Both of these effects were statistically significant, and accounted for 50% of the between group variance, and a further 19% of the within group variance in task performance. Because individual helping was grand mean centred, the effect of group helping can be interpreted as a conditional effect, which controls for the effect of individual level helping. These results therefore supported hypothesis 2; that group level helping would influence individual task performance.

At step 4 I added the interaction of tower status and group helping. The interaction term was computed by multiplying the tower status variable by the group helping variable. Adding this effect allowed me to test hypothesis 3; that group
helping would have a stronger effect on task performance in the more interdependent tower environment. Although the interaction effect was in the predicted direction, it did not attain statistical significance, and did not account for any further between group variance. Hypothesis 3 was therefore not supported.

Hypotheses 4 and 5 concerned the relationships between group level helping, individual task performance and individual effectiveness in the tower and enroute environments. Results for these hypotheses are shown in table 5.7 in the same format as the results for the previously tested hypotheses.

Hypothesis 4 concerned the relationship between group level helping and traffic efficiency. At the first step I again estimated a null model. The results showed that 39 percent of the variation in traffic efficiency was between groups. At step 2 I added the control variables of ATC tenure, group size, traffic complexity, traffic volume, and tower status. ATC tenure was the only significant predictor of efficiency, with more experienced ATCs achieving higher levels of efficiency. Traffic complexity was marginally significant, with more complex groups recording lower levels of efficiency. These variables accounted for 12 percent of the variance between groups and 4.6 percent of the variance within groups. At the next step, I entered the substantive variables of group and individual level helping. Both of these variables were significantly related to effectiveness, and accounted for a further 34.1 percent of the between group variance, and 6 percent of the within group variance. This result thus supports hypothesis 4.
Hypothesis 5 concerned the mediating role of individual task performance. In order to demonstrate that individual task performance mediates the relationship between group helping and traffic efficiency, it is first necessary to show that group helping is related to individual task performance and to traffic efficiency. These requirements have been met. It is now necessary to show that individual task performance accounts for some or all of the variation that is shared between group helping and traffic efficiency (Baron & Kenny, 1986). This can be done by adding individual task performance to the equation predicting traffic efficiency (Griffin, Mathieu & Jacobs, 1997). If the effect of group helping on traffic efficiency drops significantly, then one can conclude that individual task performance has a mediating effect. The results for step 4 showed that adding individual task performance to the equation resulted in a drop in the effect of task performance from 0.62 ($p < .05$) to 0.41 ($p < .05$).

I tested the significance of this drop by estimating the model at step 4 again, but with the effect of group helping constrained to equal 0.62. If this constraint caused a significant drop in model fit, then one can conclude that the difference in parameter
levels is unlikely to be due to chance. Model fit was assessed by the model deviance statistic (-2*log likelihood). A change in deviance can be evaluated against a chi-square distribution with degrees of freedom equal to the difference in the number of parameters being estimated (Raudenbush & Bryk, 2002). Applying the constraint results in an increase in deviance of only 1.54, which was not significant. As a result, hypothesis 4 was not supported. While there was some mediation, the proportion of variance mediated by task performance did not differ significantly from zero.

Discussion

The idea that group levels of extra-role helping might influence individual task performance is not new (Katz, 1964; Organ, 1988; Borman & Motowidlo, 1993; Podsakoff & MacKenzie, 1997). I am not aware, however, of any studies that have directly tested this relationship. In this study, I hypothesised that ATCs would exhibit higher levels of task performance when they were in groups characterised by high levels of extra-role helping. The results of the study were consistent with this hypothesis. This is an important study because it was based on, and provides empirical support for, a specific mechanism that may link group level extra-role helping with group effectiveness.

The results of the study, however, were not consistent with all hypotheses. I expected that extra-role helping would have a stronger effect on task performance in the tower environment compared to the enroute environment. Although the hypothesised interaction between tower/enroute status and group level helping was in the expected direction, it did not attain statistical significance. I also expected that individual task performance would mediate the relationship between group helping and individual effectiveness. Tests of mediation, however, did not attain statistical significance. I explore these unexpected findings below.

Differences between the tower and enroute environments

The task design in enroute groups resembles a sequential task, with aircraft moving from one ATC to another along a set route. The task design in tower groups, however, resembles a reciprocal task, with ATCs working collaboratively to solve traffic problems at a particular airport. Based on these differences, I expected that
tower groups would exhibit more interdependence in their work than enroute groups (Thompson, 1967). In previous research, higher levels of interdependence have been associated with higher levels of helping (Wageman, 1995), and so I anticipated that the mean level of helping in tower groups would be higher than the mean level of helping in enroute groups (hypothesis 1). I also expected that group helping would have a stronger impact on individual task performance in tower groups compared to enroute groups (hypothesis 3). The data, however, did not support either of these hypotheses.

One reason for these unexpected findings may be that the differences in task design between the tower and enroute groups did not produce reliable differences in task interdependence. For example, some towers may have been able to structure their interaction patterns so that very little interdependence was required, while some enroute groups may have established normative interaction patterns that were highly interdependent. Previous studies have shown that teams with similar task designs can vary widely in the amount of interdependence experienced by team members (Campion et al., 1993; Wageman, 1995). The tower and enroute groups in this study may have exhibited similar levels of divergence in interdependence. Unfortunately, I did not directly measure interdependence within this study. For this reason, it is impossible to know how much the levels of interdependence varied among the tower and enroute groups.

**Mediating Role of Individual Task Performance**

It was proposed that individual task performance would mediate the relationship between group helping and individual effectiveness as measured by traffic efficiency. The results showed that group helping influenced individual task performance, and that individual task performance also influenced individual traffic efficiency. Furthermore, group helping was related to individual traffic efficiency. The mediated hypothesis, however, was not supported because individual task performance did not account for a significant portion of the variance shared between group helping and individual traffic efficiency. This failure to confirm the mediated hypothesis may be a function of sample size and statistical power. In multilevel studies, statistical power depends on the number of units at both the group and the individual level (Snijders, 2005). There were only 45 group level units in the current
study, and it may be that the proportion of mediated variance would have attained statistical significance if more groups were assessed.

Alternatively, it may be that task performance does not in fact mediate the relationship between group helping and individual traffic efficiency, and that the decision to reject hypotheses 5 is correct. Taking this result at face value suggests that group helping was related to traffic efficiency for reasons other than enhancing the task performance of individual ATCs. In other words, group levels of helping can enhance traffic efficiency even when the task performance of ATCs within the group remains constant.

It may be that acts of helping allow ATCs to coordinate their actions more effectively, without necessarily increasing their individual levels of task performance. For example, in helping another group member an ATC might gain some information about the status of the traffic within their co-worker’s sector or area of responsibility. The ATC might not perform any better as a result of learning this information; however he or she may be able to adjust his or her behaviour to coordinate more effectively with the other ATC. This enhanced coordination may lead to an increase in traffic efficiency. Future research that examines the level of coordination and interdependence within groups may therefore explain the findings of the current study more clearly.

Further Research on Task Facilitation

This study tested hypotheses based on the task facilitation model presented in chapter 3, but it did not test all of the propositions and relationships contained within that model. Figure 5.1 below shows the task facilitation model as proposed in chapter 3, with the relationships confirmed by this study shown in bold lines, and the untested or unconfirmed relationships shown in dashed lines.

As can be seen in figure 5.1, I did not assess in this study the relationships between group helping, declarative knowledge, procedural knowledge and skill, and individual task performance. These relationships are important, because they explain why group level helping is expected to have a sustained impact on individual task performance. Although the results of the current study support a relationship between group helping and task performance, it may be that this relationship is not mediated by individual knowledge and skill. Further research on the task facilitation mechanism should therefore address these mediated relationships in more detail.
In addition, and as discussed above, the current study did not directly measure task interdependence within groups, but rather relied on external technological differences as a proxy for interdependence. This design did not result in an effective test of the moderating effect of task interdependence. Future research should therefore also address this aspect of the task facilitation model.

Figure 5.1 Task facilitation relationships supported by study 1

**Practical Implications**

The results of this study re-affirm the positive effects that extra-role helping may have within work groups, and suggest that group levels of helping may influence both the performance of individual members, and their level of effectiveness. Managers may therefore be advised to ensure that the group context allows for and supports constructive helping among members. For example, studies show that individuals are more likely to help their co-workers in organisational environments characterised by high levels of morale and a positive interpersonal climate (Organ & Ryan, 1995). An important managerial role may therefore be facilitating such an environment.

The results of this study also suggest that group members were able to exhibit helping even when task design and technological factors may have made helping
difficult. ATCs exhibited high amounts of helping in enroute groups, even though the task was designed to be relatively independent. Helping may have been provided during common off-shift times, when ATCs were together but not actually controlling traffic. At such times, ATCs would be able to exchange ideas and information that may enhance declarative knowledge and hence task performance, even though the task environment itself was relatively independent. From a practical perspective, it may be important for organisations to provide a context for such interactions to occur when the task itself is independent. Providing an opportunity for employees to share ideas and strategies in this way may have positive effects on the subsequent levels of task performance and effectiveness achieved by individuals.

Limitations

Although the study provided a good starting point for the investigation of task facilitation effects, there are some limitations which could be remedied in future research. One important limitation was relying on a single source of data, supervisory evaluations, for most of the data. The data may therefore have been contaminated by common method variance, resulting in an increase observed relationships between variables (Podsakoff & Organ, 1986). In future research, it may be possible to use objective indicators of effectiveness. For example, traffic flight times for the aircraft under the control of an ATC could be used instead of supervisory ratings of traffic efficiency.

Another important limitation is the cross-sectional nature of the study. The conceptual model on which the study is based is causal in nature. Unfortunately, the data does not support causal inference as the predictor and outcome variables were collected simultaneously. Although I hypothesised that group helping would contribute to traffic efficiency, it may be that a more efficient traffic flow gives the ATCs in a group more opportunity to help each other. Separating the measures of predictors and outcomes in time by conducting a longitudinal study would address these problems.

Conclusions

Since at least 1964 theorists have claimed that extra-role helping should be linked to group effectiveness (Katz, 1964; Organ, 1988; Podsakoff & MacKenzie, 1997). However, the mechanisms by which extra-role helping might influence group
effects have not been specified in detail, nor have they been directly tested empirically. In this chapter, I have argued that group level extra-role helping may be beneficial because it facilitates the task performance of individual group members. The empirical results supported this argument. Specifically, ATCs who worked in groups that exhibited more helping tended to perform better. These results were obtained even when controlling for the ATC’s own level of helping, the ATC’s tenure, and the volume and complexity of traffic being managed by the ATC. These results suggest that the task facilitation mechanism may provide a viable theoretical basis for the claim that extra-role helping is related to group effectiveness.
CHAPTER 6: A SURVEY STUDY OF CLIMATE BUILDING

Schneider (1987) argues that it is the people within a group that make that group what it is. Turning Kurt Lewin’s famous formula on its head, he argued that the environment is a function of the people in that environment and the behaviour they exhibit: \( E = f(P, B) \). Consistent with this argument, I suggest that the helping and voice behaviours exhibited within the group form an important aspect of the social and psychological environment of group. A group in which members routinely exhibit helping behaviours will feel very different from a group in which helping behaviours are absent, even if the two groups are performing similar tasks. Similarly, a group in which members routinely challenge the status quo and argue with one another about change will feel very different to a group in which members passively accept the status quo. The different environments or contexts established by these extra-role behaviours are likely to have a strong impact on members’ affective experiences, behaviours, and beliefs about the group.

I propose that that group levels of helping and voice will influence judgements that group members make regarding the affective climate within the group. In this study I also investigate the moderating role played by group goal clarity. I argue that groups with low levels of goal clarity are operating in a more ambiguous task environment. Consistent with the climate building mechanism described in chapter 4, I argue that this contextual feature of the group will influence the motives to which voice behaviours are attributed. I propose that helping behaviours, however, will remain unaffected by the level of goal clarity within the group.

The rest of this chapter is structured as follows. First I describe the aspects of group affective climate that I will be examining in this study. I then introduce and define the construct of group goal clarity, and locate it within the broader construct of group task ambiguity. Having defined the key constructs within the study, I then present a series of hypotheses. I then present the study method, and finally, I present the results, and then the discussion.
**Group Affective Climate**

Group climate refers to the shared perceptions that group members have of the group and the work environment within the group. The group climate can be distinguished from the climate perceptions of individual group members, which James and Jones (1974) refer to as psychological climate. To the extent that these individual perceptions are shared among employees, then a group climate can be said to exist (James & Jones, 1974). In this study, the outcome that I focus on is psychological climate.

Ostroff (1993) distinguished between affective, instrumental and cognitive dimensions of climate. Affective climate relates to the affective tone of work related intra-group interactions. I examined affective climate because helping and voice represent highly salient aspects of the social and interpersonal environment within work groups. As such, they should influence the judgements of affective climate.

I measure two sub-dimensions of affective climate, which are morale and professional interaction climate. I define morale as the feelings of pride, energy, and enthusiasm that group members have for the group’s work (Hart et al., 2000). Scott (1967) provides a similar definition, describing morale as the extent to which group members collectively pursue group goals in a vigorous and enthusiastic manner. Professional interaction climate relates to the quality of task related interactions among group members. Positive levels of professional interaction are associated with effective teamwork, cooperation and communication among group members. Griffith (2006, pp. 1859) referred to a similar construct in high schools by the term “staff collegiality”. His measure included items such as “I regularly discuss my teaching methods and strategies with other school staff members” and “School staff members work well together” (Griffith, 2006, pp. 1859-1860). Morale and professional interaction climate are related, because they both relate to the way group members work with one another. In this chapter, therefore, I make similar hypotheses for both sub-dimensions.
**Group Goal clarity**

In the conceptual model of climate building presented in chapter 4, task ambiguity was presented as an important contextual factor that would influence whether individuals made self-serving or altruistic attributions for voice behaviour. I argued that in ambiguous environments, group members would perceive a greater need for voice behaviour, and would therefore attribute voice behaviours to an altruistic desire to benefit the group. When groups are clear about their tasks and goals, however, voice behaviour is likely to be regarded as unnecessary, and as a hindrance to achieving the group’s goals. Group members should therefore be more likely to attribute voice behaviour to self-serving motives.

The level of task ambiguity within a group may be indicated by a number of factors, including role ambiguity, uncertainty regarding group goals, and the degree of environmental change. In this study I focus on group goal clarity. Group goal clarity refers to the extent to which group members are clear about the goals of their work group (Griffith, 2006; Gerard, 1957). Group goal clarity will be high when group members collectively perceive that the group is working towards clear, specific and consistent goals. Individuals within the same group are likely to agree with one another in their ratings of group goal clarity, because common factors such as the behaviour of group leaders and amount of change within the group will affect the goal clarity perceptions of all group members equally. Group goal clarity can therefore be understood as a group-level construct. Groups that are high in goal clarity know precisely what the group is aiming for. Groups that are lower in goal clarity, however, do not have shared sense of where they are going, or what the purpose of the group is.

**Hypotheses**

As described in chapter 4, I expect that the climate perceptions of individual members will be influenced by group levels of extra-role helping and voice. I argue that these effects can be explained as environmental perception effects and social influence effects within the context of Salancik and Pfeffer’s (1978) theory of social information processing. Environmental perception effects relate to the direct relationship between witnessing acts of helping or voice, and subsequent climate judgements. Social influence effects relate to the way in which co-workers’ extra-role behaviours communicate the attitudes that they hold towards the group, and these communicated attitudes – rather than the extra-role behaviours as such – influence the
Effects of co-workers’ extra-role behaviour

subsequent climate judgments of individuals within the group. I use these two effects to make hypotheses linking group levels of helping and voice to individual climate perceptions. Having presented these hypotheses, I then introduce proposed interactive effects of group goal clarity.

Main effects on climate perceptions

When group members exhibit voluntary acts of helping, they demonstrate that they are willing to exert extra effort in order to support the group. These behaviours indicate high levels of pride, enthusiasm and energy within the group. They also communicate supportive attitudes towards the group. All of these effects should enhance the morale perceptions of individual group members who witness the helping behaviour. Perceptions of professional interaction climate should also be enhanced because high levels of helping indicate that group members are cooperating and working effectively with one another. Extra-role helping should also communicate positive attitudes towards co-workers, and a desire to contribute to the performance and effectiveness of co-workers.

Hypothesis 1: Group levels of extra-role helping will be positively associated with individual perceptions of morale.

Hypothesis 2: Group levels of extra-role helping will be positively associated with individual perceptions of professional interaction climate.

Group levels of voice will also influence perceptions of affective climate. When co-workers challenge the status quo, group members are likely to feel threatened and apprehensive regarding the implications for themselves and the work group. The suggestion that change is necessary may imply that something is wrong with the group, and the individual’s perceptions of morale may suffer. In addition, when there are high levels of voice within a group it is likely that individuals will feel that co-workers are arguing with one another and fighting with one another, rather than supporting and cooperating with one another. High levels of voice should therefore produce less positive perceptions of professional interaction climate.

Hypothesis 3: Group levels of extra-role voice will be negatively associated with individual perceptions of morale.

Hypothesis 4: Group levels of extra-role voice will be negatively associated with individual perceptions of professional interaction climate.
Interactive effects of goal clarity

I argue that group goal clarity will influence the way in which group members interpret the voice behaviour that occurs within the group. Specifically, I expect that voice will be attributed to self-serving motives when group goal clarity is high, and to altruistic motives when group goal clarity is low. When voice behaviours are attributed to altruistic motives, and are perceived to be exhibited for the benefit of the group, they may be seen as invigorating the environment with fresh ideas and challenging goals. Voice behaviours should therefore communicate a positive attitude and a belief that group issues and problems can be overcome. These effects should lead co-workers to make more positive evaluations of morale within the group. However, when voice behaviour is attributed to self-interest, observers are likely to conclude that people in the workplace are more concerned about their own welfare than group success. The voice behaviours will therefore communicate a lack of concern for the group, and perceptions of morale will suffer.

Hypothesis 5: Group voice and group goal clarity will interact to predict morale, such that voice will be positively related to morale when group goal clarity is low, and negatively related to morale when group goal clarity is high.

I have similar expectations for the effects of voice and goal clarity on professional interaction climate. When attributed to altruistic intentions, voice behaviours indicate a desire to positively engage fellow group members in constructive debate and problem solving. The behaviour therefore communicates a positive attitude towards other group members. Under these conditions, voice behaviours should enhance perceptions of professional interaction climate. On the other hand, when attributed to self-interest, voice behaviours would imply that the group members are concerned only about themselves and not about others within the group. Under these conditions, voice should lead to decreased perceptions of professional interaction climate.

Hypothesis 6: Group voice and group goal clarity will interact to predict professional interaction climate, such that voice will be positively related to professional interaction climate when group goal clarity is low, and negatively related to professional interaction climate when group goal clarity is high.
Method

Participants and Procedure

This study was conducted in a large Australian public sector organisation employing over 4000 individuals. The primary task of the organisation is strategically planning and developing road infrastructure, and managing an extensive road network. Employees in this organisation were organised into work groups, each of which was responsible for a specific function. Each individual’s role within their group was documented in a position description, however group members were also able to exhibit a range of extra-role behaviours that went beyond these role requirements.

The study variables were measured by an employee attitude survey. The survey was administered on an organisation-wide basis to 3744 individuals, and 2862 surveys were returned (response rate 76%). These 2862 individuals were organised into 177 work groups. Work groups ranged in size from 6 to 95 people, with an average group size of 16.65 people (SD = 15.55) and a median group size of 12. Of the 2862 respondents, 2160 (75.6%) were male and 676 were female (23.5%). The average age of respondents was 40.31 years (SD = 11.1) and the average organisational tenure was 12.5 years (SD = 10.64).

Measures

Respondent gender, tenure in the organisation, and group size were included in the study as control variables. All of the remaining study variables were self-ratings of individual behaviours, or climate perceptions, assessed via an organisational survey.

Morale, professional interaction climate and group goal clarity were each measured by three item scales, all of which were adapted from the School Organisational Health Questionnaire (Hart et al., 2000). Responses on these scales ranged from 1 “strongly disagree” to 5 “strongly agree”. An example item for morale was, “people in my work group are enthusiastic about their work” (Cronbach’s $\alpha = 0.88$). An example item from professional interaction was, “there is good communication among staff in my work group” ($\alpha = 0.73$). An example item from
goal clarity was, "the goals in this work unit are not easily understood" (reverse scored; $\alpha = 0.71$). The full sets of items for these scales are reported in appendix B. Voice was measured using three items adapted from Van Dyne and LePine (1998). An example item was, "to what extent have you risked disapproval from co-workers to express your beliefs about what’s best for this group" ($\alpha = 0.85$). Responses were made on a 5-point scale ranging from “very little” to “a great deal”. Helping was assessed using the same response categories, with three items based on scales developed by Van Dyne and LePine (1998) and Podsakoff et al. (1990). An example item was "to what extent have you provided help to co-workers when asked or needed" ($\alpha = 0.77$). The full set of helping and voice items is presented in appendix B.

Assessment of discriminant validity

The independent variables of helping, voice and goal clarity were all drawn from the one source. Prior to entering these variables into a prediction equation, it is necessary to demonstrate that the study participants were distinguishing between these different constructs. This was done by conducting a principle components analysis on the individual level data from all participants. Oblimin rotation was used, as the factors were expected to be correlated. As shown in table 6.1 below, the items addressing helping, voice, and goal clarity loaded uniquely on three distinct components with eigenvalues greater than one. Correlations among the factors were low to moderate, ranging from 0.03 (voice and goal clarity) to 0.45 (helping and voice). Overall, these results support the discriminant validity of the measures used.
Table 6.1: Principle Components Analysis of Variables from Study 2.

<table>
<thead>
<tr>
<th>Component</th>
<th>Voice</th>
<th>Goal Clarity</th>
<th>Helping</th>
</tr>
</thead>
<tbody>
<tr>
<td>% variance</td>
<td>37.6</td>
<td>21.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Voice 1</td>
<td>0.92</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Voice 2</td>
<td>0.85</td>
<td>0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>Voice 3</td>
<td>0.85</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Goal Clarity 1</td>
<td>0.04</td>
<td><strong>0.87</strong></td>
<td>0.03</td>
</tr>
<tr>
<td>Goal Clarity 2</td>
<td>0.03</td>
<td><strong>0.81</strong></td>
<td>0.04</td>
</tr>
<tr>
<td>Goal Clarity 3</td>
<td>0.05</td>
<td><strong>0.73</strong></td>
<td>0.00</td>
</tr>
<tr>
<td>Helping 1</td>
<td>0.01</td>
<td>0.04</td>
<td><strong>0.88</strong></td>
</tr>
<tr>
<td>Helping 2</td>
<td>0.08</td>
<td>0.03</td>
<td><strong>0.86</strong></td>
</tr>
<tr>
<td>Helping 3</td>
<td>0.06</td>
<td>0.05</td>
<td><strong>0.77</strong></td>
</tr>
</tbody>
</table>

*N* = 2862.

Loadings greater than 0.30 are shown in bold type.

**Analysis Strategy**

I used hierarchical linear modelling (HLM) to examine the effects of group helping and voice on individual climate perceptions. The analysis strategy was therefore the same as that presented in the first study (Chapter 5). Of interest in this study were the effects of the group level measures of helping, voice and goal clarity. The corresponding individual level measures were grand mean centred prior to analysis. Because grand mean centring was used, the individual level and the group level variables will be correlated with one another (Hofmann & Gavin, 1998). As such, the impact of the group level variable can be interpreted as a conditional effect, taking into account or controlling for the impact of the individual level variable. The group level effects can therefore be understood as contextual effects, describing the impact that the group context (in terms of helping, voice or goal clarity) has on individual climate perceptions.

In order to test the hypotheses I conducted the analysis in a series of steps, beginning with a null model in which no predictors were entered, and then sequentially adding variables, beginning with the control variables followed by the
explanatory variables, and then interactions between the explanatory variables. The individual level portion of each model was specified as a random coefficient model, so the nature of the within group relationships could vary randomly between groups. At each step I report the raw parameter estimates for each predictor; these effects can be interpreted in a similar way to unstandardised regression weights in ordinary least squares regression. I also report the proportion of within group and between group variance explained at each step. In the HLM analysis some computational problems in model estimation were encountered. In order to fix these problems, all of the variables were normalised using the Blom procedure in SPSS prior to analysis (SPSS, 2006). Furthermore, it was necessary to add in the two group level interactions of interest separately rather than estimating them together.

Results

A correlation matrix of all the individual level variables in the analysis is shown in Table 6.2. It can be seen that voice and helping were both related, albeit weakly, to morale and professional interaction climate. Interestingly, voice was weakly positively related to both climate variables, and so it would appear from the individual level analysis that the group members who exhibited voice tended to have more positive perceptions of group climate. This is consistent with Withy and Cooper’s (1989) finding that people exhibit voice when they genuinely want to contribute to the group. Larger groups were likely to have slightly more negative climate perceptions, along with lower levels of voice and helping.

Goal clarity displayed the strongest relationships with the two climate variables, with low levels of goal clarity being associated with poorer morale and professional interaction climate. It is likely that a lack of clear goals reduces the probability that a group will experience the morale building effects of achieving specific goals. Professional interaction may also be more negative, as group members are likely to be arguing about the goals that should be set, rather than working constructively towards goals. These relationships are interesting in their own right, however their chief importance in the current study is that that they may limit the proportion of variance in climate that helping and voice can account for.
Table 6.2: Means, Standard Deviations and Correlations for Study 2.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender*</td>
<td>1.24</td>
<td>0.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tenure</td>
<td>16.65</td>
<td>15.55</td>
<td>-0.28*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Group Size</td>
<td>12.35</td>
<td>10.57</td>
<td>-0.19*</td>
<td>0.11*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Voice</td>
<td>3.46</td>
<td>0.86</td>
<td>-0.05*</td>
<td>0.05*</td>
<td>-0.06*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Helping</td>
<td>3.84</td>
<td>0.73</td>
<td>0.05*</td>
<td>-0.02</td>
<td>-0.08*</td>
<td>0.48*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Goal Clar.</td>
<td>3.33</td>
<td>0.77</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.14*</td>
<td>0.05*</td>
<td>0.20*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Morale</td>
<td>3.39</td>
<td>0.88</td>
<td>0.02</td>
<td>0.04</td>
<td>-0.15*</td>
<td>0.13*</td>
<td>0.23*</td>
<td>0.74*</td>
<td></td>
</tr>
<tr>
<td>8. Prof. Int.</td>
<td>3.57</td>
<td>0.75</td>
<td>0.02</td>
<td>-0.01</td>
<td>-0.18*</td>
<td>0.13*</td>
<td>0.30*</td>
<td>0.64*</td>
<td>0.68*</td>
</tr>
</tbody>
</table>

*p<.05

*Males coded 1, females coded 2

N = 2862.

Aggregation of Helping, Voice and Goal Clarity to the Group Level

As in the previous study, I specified a direct consensus composition model for the aggregation of helping and voice to the group level (Chan, 1998). I assessed agreement within groups using the $r_{wg(j)}$ statistic, I assessed the meaningfulness of between group variation in helping and voice using the ICC(1) statistic, and the reliability of the group means using the ICC(2) statistic. The average $r_{wg(j)}$ for helping was 0.75, and 68.1% of groups attained an $r_{wg(j)}$ that was higher than 0.70. The average $r_{wg(j)}$ for voice was 0.63, and 36.7% of groups attained an $r_{wg(j)}$ that was higher than 0.70. The ICC(1) statistics were 0.09 for helping and 0.07 for voice, both of which were statistically different from zero. The levels of ICC(1) are slightly lower than the median of 0.12 that Bliese (2000) reports for aggregation studies in the organisational behaviour literature. This suggests that the groups in the current study may not have been particularly effective in maintaining common levels of helping and voice. Nevertheless, these findings do suggest that there is a degree of reliable within group homogeneity and between group heterogeneity in the measures of helping and voice. The ICC(2) statistics were 0.62 for helping and 0.55 for voice. Again, these figures are somewhat lower than those typically reported in other research, due to the lower levels of ICC(1).
For group goal clarity I specified a referent-shift composition model for the aggregation of individual measures to the level of the group (Chan, 1998). The items in the group goal clarity measure all referenced the group as the target to be evaluated. It is, however still necessary to demonstrate that group members agreed with one another in their evaluations of group goal clarity. The average $r_{wg(j)}$ for group goal clarity was 0.73, and 68.1% of the groups exceeded 0.70 on this statistic. The ICC(1) for goal clarity was 0.17, and the ICC(2) was 0.76. These results suggest that group goal clarity was a stronger group level construct than helping or voice.

Tests of Hypotheses

HLM was used to test all hypotheses, as detailed in the Analysis Strategy section above. I constructed the prediction equation in five steps. In step one, I estimated a null model in order to determine the extent of between group and within group variance in the dependent measure. In step 2, I added the control variables of gender, tenure, and group size. In Step 3, I added the effects of voice and helping at the individual and group levels. In step 4, I added the effects of goal clarity at the individual and group levels. Finally, in step 5, I added the interaction between group goal clarity and group voice. For control and comparison purposes I also added the equivalent interaction at the individual level (Yang, et al., 2007). Step 5 was carried out twice, once for the interactions with voice (5a), and once for the interactions with helping (5b).

The parameter estimates for morale are shown in table 6.3. At the first step I entered a null model containing no predictors. This model showed that 13.3% of the variation in morale was between groups. This portion of variance was statistically significant, thus indicating that there is some group level variance in morale that can be explained by the group level predictors.

At step 2, the control variables of gender, tenure and group size were added. All of these variables had significant effects on morale. Men reported a higher level of morale than women, people with longer tenure reported higher levels of morale, and people in smaller groups reported higher levels of morale. Together, these variables accounted for 6.2% of the between group variance, and 1.9% of the within group variance.
Effects of co-workers’ extra-role behaviour

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Parameter Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td>Constant</td>
<td>0.07*</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Tenure</td>
<td>0.05*</td>
</tr>
<tr>
<td>Group Size</td>
<td>-0.08*</td>
</tr>
<tr>
<td>Individual Helping</td>
<td>0.20*</td>
</tr>
<tr>
<td>Group Helping</td>
<td>0.29*</td>
</tr>
<tr>
<td>Individual Voice</td>
<td>0.01</td>
</tr>
<tr>
<td>Group Voice</td>
<td>-0.02</td>
</tr>
<tr>
<td>Individual Goal Clarity</td>
<td>0.69*</td>
</tr>
<tr>
<td>Group Goal Clarity</td>
<td>0.11*</td>
</tr>
<tr>
<td>Individual voice by individual clarity</td>
<td>0.01</td>
</tr>
<tr>
<td>Group Voice by Group Clarity</td>
<td>-0.19</td>
</tr>
<tr>
<td>Individual helping by individual clarity</td>
<td>0.00</td>
</tr>
<tr>
<td>Group Helping by Clarity</td>
<td>-0.01</td>
</tr>
<tr>
<td>Between variance accounted for</td>
<td>0.0%</td>
</tr>
<tr>
<td>Within variance accounted for</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

In step 3 I added the effects of individual and group level voice, and individual and group level helping. Group level helping had a significantly positive effect on morale even when accounting for the individual’s own level of helping, which supported hypothesis 1. Group level voice, however, was not significantly related to morale, and so hypothesis 3 was not supported. The variables entered at step 3 accounted for a further 22.9% of the between group variance, and 4.5% of the within group variance.

In step 4 I added the effects of goal clarity at the individual and group levels. Both group and individual level goal clarity were strong predictors of morale. The significant effect of group level helping became non-significant at this step. Together,
Effects of co-workers’ extra-role behaviour

group and individual level goal clarity accounted for a further 54.9% of the between group variance, and a further 46.5% of the within group variance. At this step a total of 84% of the between group variance was accounted for, however the remaining residual variance was still statistically different from zero, indicating that there was still a portion of group level variance that could potentially be explained.

In Step 5 I added the interactive effects of goal clarity. This was done twice, first for the interactions between goal clarity and voice (Step 5a), and second for the interactions between goal clarity and helping (Step 5b). As mentioned in the analysis strategy section, I included the individual level interaction as well as the group level interaction for control purposes. At Step 5a, the individual level interaction between voice goal clarity and was not significant. The group level interaction between voice and goal clarity was in the predicted direction, with higher levels of goal clarity being associated with a more negative effect of voice, however the effect did not attain statistical significance. As a result, hypothesis 5 was not supported.

At step 5b the interactions with voice were removed, and interactions with helping were estimated instead. Again, I included the individual level interactions as control variables. The interaction between individual helping and individual goal clarity was not significant, nor was the interaction group level helping and group level goal clarity. Unlike the group level interaction between group voice and group goal clarity, the interaction between group helping and group goal clarity did not approach statistical significance.

The results for professional interaction are shown in Table 6.4. The null model at step 1 showed that 9.5% of the variance in professional interaction was between groups. This portion of variance was statistically different from zero, indicating that the group level explanatory variables could account for a maximum of 9.5% of the total variance in professional interaction.

At step 2, the control variables of sex, tenure and group size were added. The effect for sex approached significance, with perceptions being more positive for men compared to women. There was also a small but significant effect for group size, with larger groups reporting less positive perceptions of professional interaction climate. Together, these control variables accounted for 25% of the between group variance, and 4.2% of the within group variance.

At step 3, I added the effects of helping and voice at the individual and group levels. The effect of group level helping on perceptions of professional interaction
climate was significantly different from zero, with higher levels of group helping being associated with more positive perceptions of morale. This result supports hypothesis 2. The effects of group level voice were not significant, and so hypothesis 4 was not supported. The variables at step 3 accounted for a further 24.4% of the between group variance, and a further 8% of the within group variance.

At step 4 I added the effects of goal clarity at the individual and group levels. Group goal clarity did not have a significant effect on perceptions of professional interaction climate, but individual goal clarity had a large and significant effect. The significant effect of group level helping became non-significant at this step. The variables added at step 4 accounted for a further 44.1% of the between group variance, and a further 30.5% of the within group variance. The total amount of between group variance accounted for at step 4 was 93.5%, however the remaining variance was still significantly different from zero, and so there was potential for further predictors to explain additional variance.

At step 5 I added the interactions between the extra-role behaviours and goal clarity. This was done separately for voice and helping. In Step 5a, I added the individual level interaction between voice and goal clarity, and the group level interaction between voice and goal clarity. The group level interaction was significant, and indicated that the effects of group voice were more negative when group goal clarity was high. This provided support for hypothesis 6. The nature of this interaction is graphed in figure 6.1. The variables added at step 5a accounted for a further 1.1% of the between group variance, and a further 0.1% of the within group variance.

At step 5b I removed the interactions with voice, and added instead the interactions with helping. The interaction between individual level helping and individual level goal clarity was not significant, and neither was the group level interaction between helping and goal clarity. The variables added at step 5b did not account for any further between group variance, and they accounted for a further 0.1% of the within group variance.
Table 6.4: Parameter Estimates for Predicting Professional Interaction

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimated Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td>Constant</td>
<td>0.07</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.09</td>
</tr>
<tr>
<td>Tenure</td>
<td>0.01</td>
</tr>
<tr>
<td>Group Size</td>
<td>-0.01*</td>
</tr>
<tr>
<td>Individual Helping</td>
<td>0.29*</td>
</tr>
<tr>
<td>Group Helping</td>
<td>0.25*</td>
</tr>
<tr>
<td>Individual Voice</td>
<td>-0.03</td>
</tr>
<tr>
<td>Group Voice</td>
<td>-0.04</td>
</tr>
<tr>
<td>Individual Goal Clarity</td>
<td>0.58*</td>
</tr>
<tr>
<td>Group Goal Clarity</td>
<td>0.04</td>
</tr>
<tr>
<td>Individual voice by individual clarity</td>
<td>0.00</td>
</tr>
<tr>
<td>Group Voice by Group Clarity</td>
<td>-0.28*</td>
</tr>
<tr>
<td>Individual helping by individual clarity</td>
<td>0.00</td>
</tr>
<tr>
<td>Group Helping by Clarity</td>
<td>-0.15</td>
</tr>
</tbody>
</table>

Between variance accounted for: 0.0% 25.0% 49.4% 93.5% 94.6% 93.5%

Within variance accounted for: 0.0% 4.2% 12.2% 42.7% 42.8% 42.8%
Discussion

In this study, I sought to examine the way in which the aggregated helping and voice behaviours of group members influence perceptions of group affective climate. As expected, group level helping had a consistent and positive effect on individual perceptions of morale and professional interaction climate. This finding supports the proposition that helping behaviours perform an important maintenance function within work groups, by contributing positively to the social and psychological environment within the group.

By contrast, the effects of group voice were more variable. Voice has typically been regarded as a risky behaviour (Stamper & Van Dyne, 2001). On the one hand, voice may be an important facilitator of adaptive change and innovation within groups. Voice brings new information and ideas into the workplace, and contributes to the constructive testing of assumptions. On the other hand, voice behaviour can have negative effects on the social and psychological environment within the group. Van Dyne et al. (1995) warn that even if voice is intended to be constructive, it “can be destructive if it is overly critical, vague, insensitive, or delivered at the wrong time.” Organ (1997, p. 92) argued that challenging behaviours such as voice may have some
positive effects when change is required, but that the group also runs “the risk of severe short-term costs to the social and psychological context that supports task performance.” These negative effects may undermine the capacity of groups to effectively implement change, leading to a net decrease in group effectiveness. Unfortunately, previous empirical research has not examined the outcomes of voice, or the factors that may influence these outcomes. As a result, it has been difficult to predict whether risks involved in exhibiting voice will pay off.

The results of this study suggest that voice can have positive or negative effects on the social and psychological environment within the group, depending on the level of goal clarity. Under conditions of low goal clarity, when group members were likely to attribute voice behaviour to altruistic motives, group voice had a positive effect on individual perceptions of professional interaction climate. Under conditions of high goal clarity, when group members were likely to attribute voice behaviour to self-serving motives, group voice had a negative effect on individual perceptions of professional interaction climate. Group voice did not have any effects on morale, although the non-significant trend was in the same direction as that of professional interaction climate.

These results therefore provide some clarity and insight into risks that voice behaviour will pose, and the circumstances under which the risk may be worth running. The results also contribute to our understanding of voice as a construct, and its relationship with other constructs. The interactive relationship between voice and goal clarity mirrors the interactive relationship between task conflict and role clarity reported by Tidd et al. (2004). In the literature review in chapter 2, I noted a number of similarities between voice and task conflict, and I suggested that task conflict may be prompted by or involve high levels of voice behaviour. The results of this study provide further evidence of the similarities between these two constructs. There has been relatively little cross-over in the voice and task conflict literatures, however it may be that a further investigation of these two constructs may be warranted, in order to further expand the nomological network in which voice is embedded.
**Further Research on the Climate Building Mechanism**

The results of this study provide some support for the climate building mechanism proposed in chapter 4. Both helping and voice were observed to influence individual perceptions of group climate. However, the study did not test all of the proposed relationships within the model. Figure 6.2 below shows the climate building mechanism as proposed in chapter 4, with the relationships confirmed in this study in bold lines, and the unexamined relationships shown in dashed lines. As can be seen, I did not directly assess the attributions that group members made for voice or helping behaviour. Thus, the role played by attributions within the climate building model remains unconfirmed. In the paragraphs below I explore the role of attributions in more detail.

Figure 6.2: Climate building relationships supported by study 2.

With regard to voice behaviour, I examined the contextual factor of group goal clarity, which I believed would influence the attributions made by group members. Specifically, I argued that voice behaviours would be regarded as more beneficial and more necessary when groups were unclear about their goals. For this reason, group members would be more likely to attribute the voice behaviours to altruistic motives. When goals were clear, however, voice behaviours would be regarded as unnecessary,
and as an impediment to achieving the goal. Thus, the voice behaviours are more likely to be attributed to self-serving motives. Although the findings were in line with expectations, there may be other explanations for the results that do not relate to the attributions for voice.

For example, it may be that group goal clarity affects the extent to which voice behaviours are regarded as threatening, regardless of the attributed motives. For example, voice may be regarded as more threatening when goal clarity is high, and this increased level of threat may produce more negative perceptions of professional interaction climate regardless of the attributions to which the voice is exhibited. Further research is therefore required on the links between voice behaviour, attributions, and climate perceptions. I am unaware of any studies that have investigated these links directly. The next chapter, therefore, includes a study in which I specifically examine these relationships.

With regard to helping behaviour, attributions were not assessed in this study, and I did not examine any contextual factors that might affect whether helping behaviours were attributed to self-serving or altruistic motives. Previous studies, however, have addressed the impact that attributions for helping have on the effects of helping, and so the need for further research into helping and attributions is less urgent. For example, Tepper et al. (2004) measured the impact that attributions for co-worker helping behaviours had on job satisfaction. They found that when helping behaviours were attributed to self-serving motives they had a negative effect on job satisfaction. When the same helping behaviours were attributed to altruistic motives, however, they had positive effects on job satisfaction. These effects are in line with those proposed in the climate building model.

Finally, the current study measured group voice and helping by asking group members to rate their own level of voice and helping behaviour, and then aggregating the data to the group level. An alternative approach is to use group referenced measures, in which each group member rates the level of voice and helping that occurs within the work group as a whole (Chan, 1998). It may be that this alternative operationalisation provides for a more reliable group level aggregate, as each group member is attempting to rate the same target (the group’s overall level of helping or voice), rather than distinct targets that are then aggregated (individual levels of helping or voice). If this alternative is indeed more reliable and valid, then it may be that future research using this operationalisation would find stronger results.
**Practical Implications**

The results of this study have important implications for practice. The management of ambiguity is a key factor in group and organisational viability (Katz & Kahn, 1978). The results of this study suggest that extra-role voice may be an important way in which groups can manage some of the negative effects that task ambiguity may have. When goal clarity is low, employees who exhibit voice may contribute valuable ideas for coping with the ambiguous environment. The results of this study suggest that these voice behaviours are likely to be attributed to altruistic motives, and may lead to more positive perceptions of professional interaction climate. Under such conditions, therefore, managers can reap the benefits of voice in terms of creative ideas for beneficial change, while enhancing the climate within the group.

The results also highlight the importance of helping behaviours, which may also form part of an overall strategy for coping with an ambiguous task environment. Although helping behaviours were no more important when goal clarity was low rather than high, they did have important positive effects on climate perceptions under these conditions. Encouraging or facilitating extra-role helping during periods of uncertainty or ambiguity may therefore contribute positively to group maintenance and viability by communicating interpersonal support and enhancing morale.

**Study Limitations**

There are some weaknesses to the current study. First, the study is cross-sectional, and thus causal conclusions cannot be made. The relationships between extra-role behaviour and climate perceptions are likely to involve reciprocal causality, with each construct influencing the other. Traditionally, researchers have examined climate perceptions as predictors of extra-role behaviour (Organ & Ryan, 1995). In this study I hypothesise an alternative causal direction, in which extra-role behaviours influence climate perceptions. The empirical literature, however, does provide some support for the idea that job attitudes and climate perceptions may influence behaviour. For example, Bateman and Organ (1983) conducted a longitudinal study in which they found that extra-role helping at time 1 had a strong and significant effect on job satisfaction at time 2. This effect was stronger than the relationship between job satisfaction at time 1 and extra-role helping at time 2. Further longitudinal work of
this type will be necessary to understand the ways in which the aggregated extra-role
behaviours of co-workers influence the subsequent climate perceptions of individuals.
This is a challenge that I take up in the next study, in which I experimentally
manipulate the perceived extra-role behaviours of co-workers, and examine the
impact on subsequent climate perceptions.

Another shortcoming of this study is the use of a single method, self ratings of
behaviour, for all sources of data. For this reason, common method variance may have
inflated the observed correlations within the study (Podsakoff & Organ, 1986).
Therorists have argued that one of the chief contributors to common method variance
is the desire of survey participants to be consistent in their responses. For example, a
participant who has just rated their supervisor as effective, may be more likely to rate
their job satisfaction as high just to remain consistent. They may therefore report a
higher level of job satisfaction than a participant who had not just been asked about
their supervisor. The likelihood of a consistency bias contributing to inflated
correlations may decrease as the hypothesised effects become more complex, and
more counter-intuitive (Yang et al., 2007). In the current study, for example, the
observed relationship between voice, goal clarity and climate perceptions involved a
group level interaction influencing an individual level outcome. This is a relatively
complex effect that relies on consistencies between the ratings of individuals within
the same group. In a single level study, by comparison, consistency effects rely only
on consistencies within survey participants. As a result, common method variance
may be less of a concern in multilevel studies that involve multiple or interactive
effects at the group level. Nevertheless, future studies should be conducted that
separate the predictor variables from the proposed outcomes.

A final weakness of the study is the relatively small size of the effects
reported. The interaction between group goal clarity and group voice accounted for
only 1.1% of the between group variance in professional interaction. The relatively
small proportion of variance accounted for may have been caused by the inclusion of
a number of main effect variables that had significant correlations with the outcomes,
for example, group goal clarity correlated with group morale at 0.87. The inclusion of
group goal clarity in the prediction equation was necessary; however it would have
removed much of the variance in the dependent measure. The small effect sizes may
also have been related to the relatively weak grouping effects in the current study.
Only a small portion of the variance in helping and voice varied systematically across
groups. Given that group level helping and voice were the primary independent variables in this study, relatively small effects would have been expected. Stronger effects may therefore be found in contexts in which groups are more effective at maintaining homogeneity within groups and heterogeneity between groups in the levels of helping and voice.

Conclusion

Extra-role helping and voice are both important aspects of work group context. The data from this study supports the proposed climate building mechanism, and suggests that these aspects of group context can influence the perceptions that individuals have regarding the group. These effects are important, because the perceptions of individual group members can influence the extent to which they will remain with and contribute to the group, and they can also influence the broader group level climate. Thus, climate building effects represent one way in which extra-role helping and voice can be functional for the group.
CHAPTER 7: AN EXPERIMENTAL STUDY OF CLIMATE BUILDING

The attributions that individuals make for extra-role helping and voice behaviour are important components of the climate building model described in chapter 4. In that model, I argued that extra-role behaviours could be attributed to either self-serving or altruistic motives. These attributions should influence whether extra-role behaviours communicate positive and supportive attitudes towards the group, or whether they communicate negative and threatening attitudes towards the group. I argued that these communicated attitudes would affect the climate perceptions of other group members via a social influence process (Salancik & Pfeffer, 1978). Thus, the attributions for extra-role behaviour may play an important role in determining whether extra-role behaviours are indeed functional for the group.

In the previous study I examined the contextual group level factor of goal clarity. I argued on conceptual grounds that high levels of goal clarity should lead to voice behaviours being attributed to self-serving motives, while low levels of goal clarity should lead to altruistic attributions. I did not, however, directly measure the attributions made. In this study, I explore the role of attributions for voice behaviours more directly. I isolate specific acts of voice behaviour, and examine the way in which the attributed motives affect the relationship between voice behaviour and subsequent climate perceptions. This study therefore addresses an important component of the climate building mechanism that was not covered in the previous study. It also represents, so far as I am aware, the first time that the relationship between voice behaviours, attributions, and climate perceptions have been examined empirically.

This study differs from the previous two studies in two important ways. First, this study focuses exclusively on the intra-individual attribution process. This study, therefore, is a single level study rather than a cross-level study. The single level study, however, provides an appropriate context for the study of the attribution process, because this process is primarily a cognitive one. Second, in this study I use an experimental method rather than a survey method. Instead of measuring the levels of voice exhibited, I manipulate the levels of voice perceived by participants; and instead of measuring attributions, I manipulate the motives to which study participants
attribute the voice behaviour. This experimental method provides some important advantages, which I discuss below.

The rest of this chapter is structured as follows. First, I describe the experimental context in which I conduct the study, and the reasons I had for selecting this context. I then present a set of hypotheses drawn from the conceptual model of climate building presented in chapter 4. My arguments for these hypotheses are brief, as much of the theoretical justification has been presented in chapters 4 and 6. I then outline the study method, followed by the results and discussion.

**Experimental Context**

The participants in this study were undergraduate management students who were placed in a simulated group context using organisational vignettes. The vignettes provided background information about the group context, and were also the means by which the independent variables were manipulated. The level of extra-role voice that occurred in the work group was manipulated by describing the actions of a co-worker who either exhibited or did not exhibit voice. In the no-voice condition, the co-worker was described as conducting standard task behaviours. Attributions were manipulated by presenting the voice and no-voice conditions in two different versions, one designed to induce self-interested attributions for the co-worker’s behaviour, and the other designed to induce altruistic attributions. Once these vignettes had been read by the participants, I then measured the participants’ perceptions of affective climate within the mock group. I also measured the extent to which participants would be interested in applying for a job with the hypothetical organisation.

I chose to conduct an experimental study for three reasons. First, different causal attributions may be made for each instance of observed behaviour (Kelly, 1973). In a field study or survey it would be difficult to isolate and gain ratings of single examples of voice behaviour. Within the experiment, however, this was easily accomplished. Second, by experimentally manipulating both the extent of voice and the attribution, grounds for causal inference are considerably strengthened. The cross-sectional survey studies reported in chapters 5 and 6 have not provided strong grounds for causal inference, and this was a shortcoming I wanted to address in this study. Finally, I am aware of no studies that have empirically investigated the links between voice behaviour, attributions and outcomes. The current study therefore represents an
initial venture under controlled conditions, in which the presence or absence of an effect can be readily determined. Should an effect be found under these conditions, then field research can be conducted to examine the relationships in genuine group settings.

Vignette studies have been used previously to study extra-role behaviour. A vignette method was adopted by Rotundo and Sackett (2002) when they studied the extent to which different types of extra-role behaviour contributed to overall judgements of performance. They constructed 32 vignettes in which individuals exhibited different levels and types of in-role and extra-role behaviour. Participants used these vignettes to rate the performance of the hypothetical individuals. For example, the vignette reproduced below was used in their study to describe an individual who exhibits high levels of task and citizenship performance, and a low level of counterproductive performance:

“Rob rarely ever makes errors when receiving money and issuing change to customers in payment for goods. He always attends functions that promote the well-being of the store. He never gossips about other cashiers.” (p. 71).

Using this methodology, Rotundo and Sackett (2002) were able to show that supervisors combine information about in-role and extra-role performance in complex ways to generate performance judgements.

The vignettes used in the current study were similar to that presented above. They established a group context in which the behaviours of a co-worker were described in different ways according to the study manipulations. More details on the vignettes used are provided in the method section.

Hypotheses

In this study I measured two aspects of affective climate: morale and professional interaction climate. These variables were also used in the previous study, and were measured in this study using the same items. Morale represents shared feeling of pride, energy, and enthusiasm among group members. I propose that voice behaviours will be related to the level of morale felt within a group. When voice behaviours are attributed to altruistic motives, and are perceived to be exhibited for the benefit of the group, they should communicate a positive attitude and a belief that group issues and problems can be overcome. These effects should lead co-workers to
make more positive evaluations of morale within the group. However, when voice
behaviour is attributed to self-interest, observers are likely to conclude that people in
the workplace are more concerned about their own welfare than group success, and
perceptions of morale will suffer.

*Hypothesis 1:* voice and attributions will interact to predict morale, such that
voice will be positively related to morale when altruistic attributions are
made, and negatively related to morale when self-serving attributions are
made.

I have similar expectations for the effects of voice and attributions on
professional interaction climate. When attributed to altruistic intentions, voice
behaviours indicate a desire to positively engage fellow group members in
constructive debate and problem solving. The behaviour therefore communicates a
positive attitude towards other group members. Under these conditions, voice
behaviours should enhance perceptions of professional interaction climate. On the
other hand, when attributed to self-interest, voice behaviours would imply that the
group members are concerned only about themselves and not about others within the
group. Under these conditions, voice should lead to decreased perceptions of
professional interaction climate.

*Hypothesis 2:* voice and attributions will interact to predict professional
interaction climate, such that voice will be positively related to climate when
altruistic attributions are made, and negatively related to climate when self-
serving attributions are made.

In addition to morale and professional interaction, I also asked participants
whether they would apply for a job with the group represented in the vignette. Job
interest was included in this study for two main reasons. First, it represents another
way of assessing the perceived attractiveness of a particular work context. One of the
reasons for investigating the climate building mechanism was that more positive
group climates should make the group more attractive to group members, enhancing
the viability of the group and reducing the probability of member turnover.
Individuals should exhibit a higher level of interest in gaining employment in groups
that are more attractive to them (Judge & Bretz, 1992), and so the assessment of job
interest should provide some information on the relationship between voice behaviour
and group attractiveness. Second, the participants in this study were second year management students, many of whom would soon be entering the job market as graduates. The task of rating job interest was therefore regarded as, perhaps, a more engaging task compared to the tasks of evaluating morale and professional interaction climate.

I expected that individuals would be likely to regard environments characterised by altruistic voice as attractive. Within such environments, members would be perceived to possess positive job attitudes, and positive levels of morale and professional interaction climate. Environments characterised by self-serving voice, however were not expected to be regarded as attractive. Rather, self-serving voice conveys Machiavellian rather than supportive attitudes, and should be associated with lower levels of morale and professional interaction climate. These factors would therefore reduce the attractiveness of the group.

**Hypothesis 3:** voice and attributions will interact to predict job interest, such that voice will be positively related to job interest when altruistic attributions are made, and negatively related to job interest when self-serving attributions are made.

**Method**

**Participants and Design.**

One hundred management students enrolled in a second-year organisational behaviour course participated in the study. The study was a 2 x 2 factorial design with behaviour (voice or no-voice) and attribution (self-interested or altruistic) as the independent variables. Subjects were randomly assigned to conditions, and usable data was available from 69 individuals. The 31 individuals for whom usable data was not available either did not complete all study measures (4 individuals) or did not attend the class across both of the two weeks in which the study was conducted (27 individuals). The mean age was 23 years (SD = 4.88). Seventy percent of the participants were women, and the sample had been employed in full or part time jobs for an average of 6.1 years (SD = 4.3).
Procedure and Materials

The study was conducted over two weeks. In the first class students were introduced to the experiment as a study of the way people make judgements about organisations. They received a description of an organisation called ‘Ant Hill’, which was involved in the design, manufacturing and distribution of sunglasses. The participants were told that they would be taking on the role of a new recruit as part of a group responsible for negotiating distribution agreements with retailers for the sunglasses. They were presented with a history of the firm, and a description of the group they would be joining. In the second week of the study, participants were presented with a case study describing a typical interaction within their group that they had observed. Four versions of the case study were prepared, one for each combination of behaviour and attribution. Each participant read their version, and then completed the dependent measures.

The case study was designed to present realistic depictions of organisational voice, exhibited against a background of in-role behaviour. The vignettes were developed by myself and another researcher, and reviewed by a third researcher familiar with the aims of the study. In addition, four PhD students unfamiliar with the study’s aims evaluated the depictions of voice behaviour and the attribution manipulations against theoretical definitions I provided. The case study was refined on the basis of these comments, and the process was repeated until the vignettes represented clear indicators of the different behaviours and attributions.

The manipulations were presented in the second week. The vignettes included a description of a typical day in which the activities of a male co-worker (Greg) were described. In all conditions, Greg was described as working on his formal job role, which was drafting the legal aspects of contracts with distributors. In the voice condition, it was additionally stated that Greg had been trying to convince others in the organisation that sales plans for a particular region should be changed. In line with definitions of voice, this was presented as an argument for change within the group. In the no-voice conditions these behaviours were omitted, and further details about Greg’s in-role work on the contracts were provided instead. The no-voice condition thus serves as a baseline against which the effects of voice can be compared.
Attributions were manipulated by describing an overheard conversation between Greg and another co-worker. In the altruistic condition, Greg stated that he exhibited either in-role or voice behaviour because he thought it was important, and believed in doing it “for the good of the organisation”. In the self-interested condition, Greg mentioned that he thought his in-role or voice performance would benefit him by making him “look good to the boss”. For example, in the voice / self-interested condition the case study read, “I let people know what my true opinions are, even when they may disagree. I happen to know that the boss likes that kind of behaviour and looking good to the boss is what it’s all about.” By contrast, the non-voice / altruistic version stated, “I worked on the legal aspects of a new contract… I think it’s important, and it’s something I believe in doing well for the good of the organisation.”

**Measures**

Unless indicated, all measures were evaluated using seven point scales that ranged from “strongly disagree” (1) to “strongly agree” (7). Full scales for this study are presented in appendix C. Morale and professional interaction climate were measured by three item scales, all of which were adapted from the School Organisational Health Questionnaire (Hart et al., 2000). An example item for morale was, “people at Ant-hill are enthusiastic about their work” (Cronbach’s $\alpha = 0.88$). An example item from professional interaction was, “there is good communication among staff at Ant-hill” ($\alpha = 0.73$). Job Interest was measured by three items that asked whether participants would be interested in working for Ant-hill, for example “I would be very interested in applying for a job at Ant-hill”. ($\alpha = 0.81$). Manipulation checks were included in order to ensure that subjects in the different conditions perceived the intended levels of voice behaviour, and made the intended attributions. Subjects were asked whether Greg would exhibit voice using three items adapted from Van Dyne and LePine (1998). An example was “Greg would risk disapproval from co-workers to express his beliefs about what’s best for Ant-hill” ($\alpha = 0.90$). Attributions were measured by a nine-point semantic differential scale that asked participants to rate whether Greg was ‘altruistic’ or ‘self-centred’. The scale ranged from $-4$ to $+4$, with higher scores indicating a more self-centred attribution. Finally, I included a general measure of Greg’s overall performance in order to ensure that differences in climate perceptions between the study conditions
could not be attributed to perceived differences in Greg’s general level of effectiveness as an employee. This measure included three items adapted from measures of task and in-role performance (Borman & Motowidlo, 1993; Van Dyne & LePine, 1998). An example item was “Greg would ensure that his tasks are completed properly” ($\alpha = 0.69$).

**Results**

A correlation matrix of study variables is shown in table 7.1. The correlation matrix includes the study dependent variables (morale, professional interaction and job interest) as well as the manipulation checks (voice, overall performance and attribution) and the control variables (sex and age). This correlation matrix reveals a number of correlates of morale, professional interaction climate and voice. Participants who perceived more voice behaviour gave higher ratings of professional interaction climate. The voice behaviour in this study involved an interaction with a co-worker, and so participants in the voice condition may have perceived higher levels of professional interaction. Ratings of Greg’s overall performance were positively correlated with professional interaction climate and morale. Manipulation checks showed, however, that ratings of overall performance did not vary systematically across study conditions. Attributions were negatively correlated with morale. Participants who attributed self serving motives to Greg tended to make more negative judgements of morale within the group. Age was negatively correlated with professional interaction climate and job interest, with older participants perceiving lower levels of professional interaction, and exhibiting less interest in the job. Sex was correlated with job interest, with males exhibiting a higher level of interest than females. For these reasons, age and sex were included as co-variates in the analyses.
Table 7.1: Means, Standard Deviations and Correlations for Study 3.

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Morale</td>
<td>4.82</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Prof. Int.</td>
<td>4.41</td>
<td>0.94</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Job Interest</td>
<td>3.76</td>
<td>0.79</td>
<td>0.11</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Voice</td>
<td>4.80</td>
<td>1.42</td>
<td>0.07</td>
<td>0.26</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Overall Perf.</td>
<td>5.00</td>
<td>0.95</td>
<td>0.25</td>
<td>0.22</td>
<td>-0.03</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Attribution</td>
<td>0.37</td>
<td>2.03</td>
<td>-0.28</td>
<td>-0.17</td>
<td>-0.13</td>
<td>-0.01</td>
<td>-0.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Age</td>
<td>22.9</td>
<td>4.88</td>
<td>-0.01</td>
<td>-0.40</td>
<td>-0.25</td>
<td>-0.16</td>
<td>-0.02</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td>8. Sex*</td>
<td>0.39</td>
<td>0.38</td>
<td>0.07</td>
<td>0.00</td>
<td>0.42</td>
<td>0.09</td>
<td>0.07</td>
<td>-0.09</td>
<td>-0.33</td>
</tr>
</tbody>
</table>

N = 69

Correlations greater than 0.24 are significant p<.05.
* Males are coded as 1, females as 0.

**Manipulation checks**

Manipulation checks showed that all manipulations worked as expected. Significantly more voice behaviour was perceived in the voice condition (M = 5.5) compared to the non-voice condition (M = 4.1), t(68) = 4.22, p<.001. Perceived levels of voice were not affected by the attribution manipulation, t(68) = 0.56, ns, and the behaviour by attribution interaction was also non-significant, F(1,63) = 0.11, ns. Greg was seen as more altruistic in the altruistic condition (M = -0.38) compared to the self-interested condition (M = 1.1), t(68) = 3.1, p<.005. The presence or absence of voice did not affect the attributions made, t(68) = 0.33, ns, and again there was no behaviour by attribution interaction, F(1,63) = 1.04, ns. These results show that the manipulations of voice and attribution were effective, with clear and simple effects that were constant across other conditions. Finally, Greg was not seen as being any more or less effective overall in the voice compared to the non-voice condition, t(68) = 0.37, ns; or in the self-serving compared to the altruistic attribution condition, t(68) = 0.64, ns. Thus differences between these conditions cannot be attributed to general performance effects.
Tests of Hypotheses

The results of the ANOVAs used to test the study hypotheses are shown in table 7.2. I conducted three univariate ANOVAs, one for each dependent variable. Sex and age were included as covariates in these analyses. The means reported below are adjusted for sex and age. In the paragraphs below I describe the results of the statistical tests for each hypothesis.

Table 7.2: ANOVA Results for Study 3.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>Parameter Estimates: Sum of Squares (F ratio)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Parameter Estimates: Sum of Squares (F ratio)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interaction</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>3.12 (0.56)</td>
</tr>
<tr>
<td>Age</td>
<td>1</td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>Voice Behaviour</td>
<td>1</td>
<td>7.96 (1.45)</td>
</tr>
<tr>
<td>Attribution</td>
<td>1</td>
<td>2.73 (0.49)</td>
</tr>
<tr>
<td>Voice by Attribution</td>
<td>1</td>
<td>24.07 (4.38)*</td>
</tr>
<tr>
<td>Error</td>
<td>63</td>
<td>340.11</td>
</tr>
</tbody>
</table>

N = 69

*p<.05

Hypothesis one stated that the morale would be influenced jointly by the behaviour exhibited and the attributions made. The behaviour by attribution interaction was significant $F(1,63)=4.38, p<.05$. Post-hoc tests showed that when self-interested attributions were made, morale was significantly higher in the non-voice condition ($M=5.1$) compared to the voice condition ($M=4.3$), $t(34)=2.3, p<.03$. When altruistic attributions were made no differences in morale were found between voice and non-voice vignettes, $t(31)=0.7, ns$. This interaction is graphed in figure 7.1 below.
Hypothesis two stated that professional interaction climate would be jointly influenced by the behaviour exhibited and the attributions made. This hypothesis was not supported, as the interaction was not significant, \( F(1,63) = 2.33, \ ns. \)

Hypothesis three stated that job interest would be jointly influence by behaviour and attribution. This interaction did attain significance \( F(1,63) = 4.86, \ p<.05. \) Further investigation showed that when altruistic attributions were made, participants were more interested in applying for a job when voice behaviour was exhibited \( (M = 4.1) \) compared to when voice was not exhibited \( (M = 3.4) \), \( t(31) = 2.15, \ p<.05. \) There was, however, no difference between the voice and no voice conditions when self-serving attributions were made, \( t(31) = 0.66, \ ns. \) This interaction is graphed in figure 7.2 below.
Discussion

I predicted that the effects of co-worker voice on individual climate perceptions would depend on the motives to which individuals attributed the voice behaviour. The results of this study confirmed these expectations. In conditions where self-interested attributions were made, co-worker voice resulted in a drop in morale. When altruistic attributions were made, however, the level of climate was not affected by voice behaviour. These results contribute to understandings of the linkages between voice behaviours and climate.

The results of this study provide support for the climate building mechanism proposed in chapter 4. The results of this study are also consistent with my interpretation of the results of the previous study. In the previous study, I proposed that group voice would affect individual climate perceptions, but I was not able to assess the direction of causality. In this study, the experimental method provided an unambiguous causal direction, with perceived levels of voice impacting on subsequent climate judgements. Furthermore, the interaction observed between voice and attributions in this study mirrors the interaction observed in the previous study. Specifically, voice behaviours in both studies were found to be negatively related to climate under conditions in which self-interested attributions were more likely to be made. These consistent findings, observed across two very different methodologies,
provide some reassuring converging evidence for the proposed climate building mechanism.

There were some important differences between the results of the current study and the previous study. In the previous study, the expected interaction emerged for professional interaction climate, while the interaction for morale was nonsignificant. In this study, however, the pattern of results was reversed, with the expected interaction emerging for morale, but not for professional interaction climate. In both studies, however, the nonsignificant interactions were trending in the same direction as the significant interactions, so it may be that the variation in the results is random. If power had been higher, then significant interactions may have been observed for both climate variables in both studies.

This study also differed from the previous study in the use of job interest as a dependent variable. I expected that job interest would be correlated with morale and professional interaction climate, because groups with more positive climates should be more attractive locations for employment. The results showed, however, that job interest and the two climate variables were not related. Nevertheless, voice behaviour and attributions interacted to predict job interest as hypothesised. The lack of a correlation with climate, however, suggests that this interaction may have occurred for different reasons. For example, it may be that environments characterised by altruistic voice were regarded by the students as offering more opportunities for individuals to express their own ideas, or as more dynamic, exciting or challenging environments. These effects may have produced the interaction predicting job interest independently of the interaction predicting climate.

Further Research on the Climate Building Mechanism

Figure 7.3 below shows the climate building mechanism as proposed in chapter 4, with the relationships confirmed in this study in bold lines, and the unexamined relationships shown in dashed lines.

When combined with the results of the previous study, all but two of the proposed relationships within the climate building mechanism have been examined in this thesis. The first of these two relationships is between task ambiguity and attributions for voice behaviour. Within the climate building mechanism, I proposed
that ambiguous task environments would make group members more likely to attribute voice behaviours to altruistic motives. The results of the two studies in this thesis provide some supporting evidence for this relationship, because task ambiguity (as indicated by low levels of goal clarity) and attributions interacted with voice in similar ways to predict affective climate perceptions. However, further empirical work will be required to confirm the relationship between task ambiguity and attributions for voice.

Figure 7.3: Climate building relationships supported by study 3

The second relationship that remains unexamined is the moderating effect of attributions for helping behaviour. I proposed that helping behaviours would contribute more positively to climate perceptions when they were attributed to altruistic motives. As mentioned in the last chapter, however, this moderating effect has been investigated theoretically and empirically by previous researchers (Tepper et al., 2004). Thus, it was less of a priority within the current thesis. Nevertheless, an examination of the effects of attributions on both helping and voice within the same study would be beneficial, as it would allow for a direct comparison of the ways in which attributions affect these two different extra-role behaviours.
Practical Implications

This study re-affirms the value of voice within groups, and provides some guidance for managers and practitioners who wish to reap the rewards of voice, such as innovation, creativity, and positive adaptation to the environment, without running the risks such as negative impacts on climate and interpersonal relationships within the group. Managers and practitioners would be advised to promote or encourage voice behaviours in contexts that are likely to generate altruistic attributions. For example, voice may be needed more when goal clarity is low, and under such circumstances, it may be more likely to be attributed to altruistic motives. Altruistic motives may also be more likely when group levels of trust are high (Simons & Peterson, 2000). Trust may be promoted by high levels of procedural justice (De Cremer & Tyler, 2007), which is an aspect of the group environment that managers may have some control over (De Cremer, van Dijke & Bos; 2006). Procedural justice is usually perceived to be higher when employees have the opportunity to provide input into decisions about them (Platow, Filardo & Troselj, 2006). This aspect of procedural justice is referred to as voice; it is interesting to note that providing voice in this sense may promote the effectiveness of voice as a form of extra-role behaviour.

The results for job interest suggest that altruistic voice may have positive effects on group viability and effectiveness because it helps attract more potential members. Environments characterised by altruistic voice may be perceived as more dynamic and exciting than environments in which employees passively accept the status quo. They may also suggest that employees can make greater use of their abilities by contributing to the firm in areas that go beyond their job.

Limitations

A limitation of the current study is the reliance on management students, and the vignette methodology. Empirical investigations have shown that while vignette style studies often give correct effect directions, they can over-estimate effect sizes (Murphy, Herr, & Lockhart, 1986). Further research is therefore required to confirm the effects found in this study, and establish their magnitude in naturalistic settings. Further research is also required using a different sample of participants. Although all of the participants in this study had at least some form of work experience, the way in
which relatively young and inexperienced individuals perceive the work environment may differ from the perceptions of more experienced employees.

Conclusion

In conclusion, the results of this study provide support for the climate building mechanism, and in particular, the moderating effect of attributions on employee voice. This is the first study that I am aware of that has examined the relationships between voice, attributions and climate perceptions. As such, it represents an important first step in the investigation of climate building effects for voice.
CHAPTER 8: GENERAL DISCUSSION

This thesis was motivated by a lack of theoretically based and empirically supported models that explained the mechanisms by which extra-role helping and voice might be functional for work groups. While theorists have made a number of arguments that support the functional nature of helping and voice, these arguments have been situated at a very broad theoretical level. For example, Organ (1988) argued that helping behaviours may help groups conserve resources; Van Dyne et al. (1995) argued that voice behaviours may assist groups to adapt to dynamic environments. Broad arguments of this nature can be fruitful, but they do need to be translated into more specific models, from which researchers can derive testable hypotheses. The lack of such models may be a factor that has contributed to the lack of empirical research into the relationships between helping, voice and group effectiveness. With regard to helping, the few studies that have been conducted have simply examined the correlations between group helping and group effectiveness, without testing any specific processes or mechanisms by which helping might influence group effectiveness. With regard to voice, very few studies have yet addressed the effects or outcomes of the behaviour.

My goal in this thesis was to address this conceptual and empirical gap by proposing and testing two narrow-range models, each of which describes a specific mechanism linking helping or voice to group effectiveness. I proposed a model of task facilitation which links group helping to individual task performance, and a model of climate building which links group helping and group voice to the climate perceptions of individual group members. The empirical studies I conducted provided a degree of empirical support for these models. As a result, I argue that the task facilitation and climate building mechanisms represent important focus points for future research on the function of helping and voice within groups. By further developing and testing these models, I argue that researchers and practitioners will be able to predict when extra-role helping and voice will contribute to group effectiveness with greater accuracy.

In this final chapter, I draw some overall conclusions based on the research presented in this thesis. First I examine the theoretical contributions made by the proposed models of task facilitation and climate building. I then discuss the strengths
and weaknesses of the approaches that I have taken to testing hypotheses derived from these models. Finally, I examine opportunities for future research, and some ways in which the results of this thesis may be applied in practice.

**Theoretical Contributions**

The theoretical contribution of this thesis can be understood by situating the proposed models of task facilitation and climate building within the context of the existing theoretical arguments that researchers have used to link helping and voice to group effectiveness. I do this separately for helping and voice, because theory and research have generally progressed separately for these two types of extra-role behaviour. Having contextualised the task facilitation and climate building models, I then explain two important ways in which these models differ from previous theoretical approaches. First, they are the cross-level in nature; and second they integrate both challenging and affiliative extra-role behaviour.

**Contributions to Helping**

The review of the extra-role helping literature in chapter 2 identified three main ways in which helping might be functional for work groups: (1) helping may contribute positively to the task performance of co-workers; (2) helping may contribute positively to group maintenance; and (3) helping may conserve group resources. The task facilitation mechanism directly addresses the first of these three arguments, while the climate building mechanism addresses the second.

The task facilitation mechanism describes the way in which group level helping can produce a sustained increase in the task performance of individual group members. I extend the literature by situating this mechanism within the context of Campbell’s model of performance (Campbell et al., 1993). I draw on this context to derive a detailed model that identifies the specific processes by which group helping might enhance individual task performance. Specifically, I propose that group helping can affect task performance by contributing to the declarative knowledge and procedural knowledge and skill of group members. I then link this mechanism to the level of task interdependence within groups, by arguing that group helping will have a stronger impact on individual knowledge and skill in more interdependent groups.

One of the theoretical contributions of the task facilitation mechanism is that it opens up some links between the research on extra-role helping, and research in related
fields such as employee performance (Campbell, 1990; Campbell et al., 1993), task interdependence (Wageman, 1995), and skill acquisition (Kanfer & Ackerman, 1989). The development of these links represents an important direction for future research on the task facilitation mechanism.

The climate building mechanism describes the way in which group level helping can contribute to group maintenance. Individuals have a degree of freedom in choosing whether to remain in or leave the work groups that they belong to. Individuals can also choose to nominally remain within a work group, while withdrawing psychologically from that group (Withy & Cooper, 1989). Group maintenance means ensuring that group members find it rewarding to remain with and contribute to the group (Bales, 1958). In the climate building mechanism, I propose that extra-role helping may fulfil this function by generating more positive perceptions of the affective climate within the group. I extend the literature by situating the climate building mechanism within the context of Salancik and Pfeffer’s (1978) theory of social information processing. I propose that group helping influences individual climate perceptions via an environmental perception process, and a social influence processes. Importantly, however, I argue that these processes will only complement each other to produce positive effects on climate perceptions when individuals make altruistic rather than self-serving attributions for helping behaviour. The climate building mechanism for helping therefore links the literature on extra-role helping with the literature on social influence (Salancik & Pfeffer, 1978) and on attributions (Kelly, 1973). Again, the development of these linkages represents an important direction for future research.

Contributions to Voice

Previous research on the outcomes of voice has also been situated at a relatively broad level. Theorists have argued that voice behaviours should facilitate or promote adaptive and beneficial change within work groups. Thus, one would expect to see a positive relationship between voice behaviour and long-term group survival in situations in which change and adaptation are necessary, for example, when the external environment is dynamic. However, researchers have suggested that voice behaviours can negatively affect the social and psychological environment within work groups. In other words, they may detract from rather than contribute to group maintenance. If group members develop negative perceptions of the climate within
the group as a result of voice behaviours, then the capacity of the group to effectively implement change may be reduced.

Although researchers have argued that voice may have negative effects on group morale, job attitudes or climate (e.g. Graham & Van Dyne, 2006; Organ, 1997; Van Dyne et al., 1995; Stamper & Van Dyne, 2001), these arguments have not been developed in to a formal model. As with helping, I extended the previous literature by situating voice within the proposed climate building model. This model outlines the environmental perception and social influence processes by which voice behaviour might contribute to the climate perceptions of individual group members.

With regard to voice, I also drew heavily on the research into task conflict. Despite the similarities between task conflict and voice, these two literatures have not significantly overlapped within the organisational behaviour field. A degree of overlap may be beneficial, however, as both task conflict and voice are challenging behaviours with similar putative benefits, such as the introduction of new ideas, beneficial change, innovation, and consideration of a greater array of alternatives. From the task conflict literature I identified attributions for voice as a key moderating variable that may determine whether voice impacts positively or negatively on climate perceptions. I was therefore able to closely integrate both helping and voice into the climate building model, as attributions were nominated as moderators for both types of behaviour.

Levels of Analysis

One of the ways in which the current research extends previous work is in the multilevel nature of the study. Multilevel research is especially relevant to extra-role behaviour. Although the behaviours are exhibited by individuals, it is at the level of the group or the organisation that they are expected to influence outcomes. Organ (1988), for example, argues that it is only in the aggregate that extra-role citizenship behaviours will have meaningful and reliable effects on organisational productivity. Research also shows that members of a group tend to exhibit common or normative levels of extra-role behaviours (Ehrhart & Naumann, 2004; George & Bettenhausen, 1990). In this way, extra-role behaviours can represent characteristics of the group, as well as individual behaviour. Theoretical approaches to extra-role behaviour therefore need to account for its effects at the individual and collective levels (Schnake, 1991).
Most of the existing research on extra-role behaviour has been conducted at a single level of analysis. Studies of the predictors of extra-role behaviour are traditionally conducted at the individual level, while researchers interested in group effectiveness have typically adopted a group level of analysis. In this thesis I have taken a multilevel approach, in which extra-role behaviours at the level of the group are proposed to influence the attitudes, behaviours and cognitions of individual members. I adopted this approach because helping and voice can only influence group effectiveness via their influence on other group members: either the members being helped, or the members who witness and respond to the arguments for change. A cross-level approach tells us how these individuals will respond to group levels of helping and voice. If these responses are relevant to group effectiveness, and I argue that they are, then the cross-level approach helps us to understand how extra-role behaviours are related to group effectiveness.

Addressing different types of extra-role behaviour

The extra-role literature has been focused on affiliative behaviours such as helping and citizenship. Challenging extra-role behaviours such as voice have received less attention. Furthermore, when they are studied, challenging extra-role behaviours tend to be examined quite separately from affiliative extra-role behaviours. Nevertheless, there have been a small number of studies that have sought to examine these behaviours within a common empirical or theoretical framework (e.g. Van Dyne & LePine, 1998). One of my aims in this thesis was to examine mechanisms by which both challenging and affiliative extra-role behaviours might influence group members.

One of the disadvantages involved in studying challenging and affiliative extra-role behaviours separately is that the commonalities between the two types of behaviour can be overlooked. For example, when Van Dyne et al. (1995) discussed the outcomes of helping and voice within groups, the outcomes that they suggested for the two types of behaviour did not overlap at all. Helping was argued to contribute to a positive climate and efficiency, while voice contributed to innovation and adaptation. In the climate building mechanism, however, I have argued that helping and voice might have similar effects on the climate perceptions of individual members. In study 2, I showed that both helping and voice could contribute positively to perceptions of professional interaction climate, under conditions of low goal clarity.
Integrating helping and voice into a common model of climate building means recognising certain similarities between the two behaviours. They are both extra-role behaviours, and so are likely to be regarded by group members as discretionary. Because they can be exhibited voluntarily, they will function as strong communicators of group member attitudes: an individual can choose to help or to withhold help, and that choice tells you something about the person and their attitude towards the group. Similarly, an individual can choose to argue for change or remain silent, and that choice also provides information on the individual’s attitudes. These behaviours, however, may be exhibited for many reasons, and so the attitudes they communicate will depend on the attributions that group members make for the behaviours. This process of attribution is similar for both helping and voice, and so it makes sense to examine these two behaviours within a common model.

Of course, the differences between the two types of behaviour will also produce variations in the effects that they have. The effects of voice on climate perceptions, for example, were moderated in study 2 by the level of goal clarity. The effects of helping, by contrast, remained constant. Voice seems to be more acceptable under conditions of low goal clarity, while helping seems to be appropriate under all circumstances. The extra-role literature is establishing a body of research on the common and unique predictors of helping and voice (Organ & Ryan, 1995; LePine & Van Dyne, 1998; Stamper & Van Dyne, 2001; Withy & Cooper, 1989). Further investigation of climate building and task facilitation effects may also allow researchers to establish a body of research on the common and unique consequences of helping and voice.

Empirical Studies

In the empirical studies I have tested hypotheses derived from the conceptual models of task facilitation and climate building. Unfortunately, it has not been possible for me to test all of the relationships and variables within both models. However, I have selected those variables and relationships that are most critical and informative. For task facilitation, this has meant examining the key relationship between group levels of extra-role helping, and individual levels of task performance. For climate building, this has meant examining the relationships between group levels of extra-role helping and voice and individual climate judgements.
The studies differ from one another in the way in which they approach the multilevel propositions made when developing the task facilitation and climate building models. Studies 1 and 2 explicitly tested the relationship between group level extra-role behaviour and individual level outcomes. Study 3 is situated entirely at the individual level, and focuses on the cognitive process of attribution, and the role that process plays in interpreting the extra-role voice exhibited by group members. As the climate building model itself includes cross level relationships and within level relationships, these different studies complement one another.

**Strengths of the Empirical Studies**

One of the strengths of the empirical studies in this thesis is the use of different methods to investigate the proposed models of task facilitation and climate building. Study 1 used supervisory evaluations of performance, which is appropriate because organisations are often interested in individual effectiveness from the point of view of the supervisor. In study 2, self evaluations of performance were used, and study 3 used an experimental method to manipulate the amount of extra-role voice and the attributions for voice. The use of different methods helps to ensure that the applicability of the studies is not restricted by reliance on a particular method.

A second strength of the studies, at least for studies 1 and 2, was the relatively large sample sizes. Study 1 included evaluations of 1067 ATCs provided by 127 supervisors in 45 groups; and study 2 included 2862 participants in 177 groups. Large sample sizes increase the accuracy of parameter estimates, and make it easier to reliably identify small effects. This turned out to be especially important for study 2, because the effect sizes were quite small. Sample size was less of a concern for study 3. As an experimental study, the parameter estimates reflect the strength of the manipulations rather than any real world population value. Given that the hypothesised effects were found, one can be confident that the sample size, while not high, was at least adequate.

**Limitations of the Empirical Studies**

The empirical studies were limited in that none of them simultaneously tested all of the proposed relationships in either the task facilitation or the climate building models. Furthermore, some relationships within the models, for example, between group level helping and individual declarative knowledge, were not tested. Thus,
while the empirical studies, in general, supported the proposed models, some relationships still need to be empirically examined.

Additionally, although the two survey studies used different methods, they were both cross sectional. For this reason, the results do not support any particular causal direction, even though the model used to derive the hypotheses included causal relationships. For example, the task facilitation mechanism proposed that group level helping behaviours would influence individual task performance. However, it may be that high levels of task performance at the group level provide members with the opportunity to help co-workers. A longitudinal analysis would have enabled causal hypotheses to be tested with greater rigour.

**Future Research**

The research presented within this thesis has supported the idea that group levels of extra-role behaviour can influence individual outcomes that are relevant to group effectiveness. Furthermore, the specific models of task facilitation and climate building were, in general, supported, and so further research into these mechanisms seems to be warranted. In both models, there remain specific relationships that have yet to be tested, and so further research on those untested aspects is required. In addition, the models have suggested links between research on extra-role behaviour and other substantive fields such as attributions, skill acquisition, task interdependence and task ambiguity. Further research exploring the relationships between helping and voice and key constructs in those other fields would also be required.

Future research could also profitably examine the task facilitation and climate building effects of extra-role behaviours other than helping and voice. Extra-role researchers have discussed a large number of different extra-role behaviours, and theorists have begun the task of developing taxonomies of the different types of extra-role behaviour (Coleman & Borman, 2000; Van Dyne et al., 1995; Williams & Anderson, 1991). Current taxonomies are largely based on differences among the behaviours in predictors or antecedents. In part, this focus reflects the lack of research on the outcomes of extra-role behaviour. An alternative taxonomic method would be to classify as similar extra-role behaviours that had similar outcomes. Thus, one could identify behaviours that had strong task facilitation effects, and compare them to behaviours that had weak task facilitation effects. Or behaviours with strong climate
building effects could be contrasted with behaviours that have strong task facilitation effects.

Finally, future research should examine mechanisms other than task facilitation and climate building. The task facilitation and climate building mechanisms were chosen because they were suggested by a number of researchers, but never elaborated into fully specified and testable models. However, other mechanisms may also be important. The results of study 1, for example, showed that group level helping influenced individual task performance and individual effectiveness independently of one another. Thus, group level helping appeared to be related to individual effectiveness for reasons other than an increase in task performance. In the discussion of study 1 it was suggested that this effect may have been found because high levels of helping allowed the group to coordinate and synchronise their activities more effectively, resulting in an increase in individual effectiveness. Investigating mechanisms such as this may allow future researchers to account for more variance in individual outcomes, and make more accurate predictions regarding the influence of extra-role behaviour on outcomes relevant to the group.

**Practical Implications**

In the discussions of the empirical studies I identified three important practical implications arising from this research. First, promoting and creating opportunities for employees to engage in helping behaviour may be important, as the level of helping within groups may influence the task performance of group members. Second, voice behaviour may be an effective resource that allows groups to manage ambiguous environments. Voice behaviours may provide effective ideas for coping with the ambiguity, and under such circumstances, they are likely to be attributed to altruistic motives, and thus have positive effects on climate (study 2), or at least not damage the climate (study 3). Finally, managers and practitioners are advised to generate group environments where altruistic rather than self-serving attributions are made by group members. Such environments may be characterised by high levels of trust (Simons & Peterson, 2000), or procedural justice (De Cremer & Tyler, 2007). By generating positive environments, managers are likely to increase the number of extra-role behaviours that occur within the group (Organ & Ryan, 1995), and ensure that these behaviours have further positive effects on climate.
Conclusion

Individual behaviour in groups is a function of a number of different factors; however one of the most important factors may be the extra-role behaviours of other group members. These extra-role behaviours form an important component of the technical, social and psychological context in which individual members work. In this thesis, I have argued that the effects that extra-role behaviours have on individuals can be explained, in part, as task facilitation and climate building effects. I proposed models of these effects, and tested those models in three empirical studies. These studies provided support for the mechanisms and suggest that further research into the mechanisms is warranted.
REFERENCES


satisfaction, and organizational citizenship behaviors. *Leadership Quarterly, 1*, 107-142.


APPENDIX A: MEASURES FROM CHAPTER 5


This appendix is not available online. Please consult the hardcopy thesis available from the QUT Library
APPENDIX B: MEASURES FROM CHAPTER 6

In this section of the survey we would like you to think about your attitudes towards your work unit. Your work unit is the group of people with whom you undertake your day-to-day work.

A. The first set of questions ask you to think about your work unit leader:
My work unit leader:
1. Has a clear understanding of where our work unit is heading in the future 1 2 3 4 5
2. Expresses a clear direction for the future of the unit 1 2 3 4 5
3. Creates an exciting and attractive image of where the work unit is going 1 2 3 4 5
4. Challenges me to think about old problems in new ways 1 2 3 4 5
5. Encourages me to question my assumptions about work 1 2 3 4 5
6. Stimulates me to rethink the way I perform my job 1 2 3 4 5
7. Considers my personal feelings when implementing actions that will affect me 1 2 3 4 5
8. Takes into account my personal needs 1 2 3 4 5
9. Ensures the interests of employees are considered when making decisions 1 2 3 4 5
10. Acts in a supportive manner 1 2 3 4 5
11. Instills a sense of pride in our unit by focusing on what we do well 1 2 3 4 5
12. Inspires confidence by saying positive things about the work unit 1 2 3 4 5
13. Encourages staff to believe in themselves and in the unit 1 2 3 4 5
14. Encourages staff to develop their job-related skills 1 2 3 4 5
15. Suggests training to improve my ability to carry out my job 1 2 3 4 5
16. Coaches staff to help them improve their on-the-job performance 1 2 3 4 5

B. The next set of questions concern the quality of the teamwork that you experience:
1. My work unit often reviews its goals and targets 1 2 3 4 5
2. The methods used by the work unit to get the job done are often discussed 1 2 3 4 5
3. We regularly discuss whether the unit is working well together 1 2 3 4 5
4. Decisions within the work unit are made in an unbiased manner 1 2 3 4 5
5. In my work unit, staff concerns are heard before decisions are made 1 2 3 4 5
6. All job decisions in my work unit are applied consistently across all affected employees 1 2 3 4 5
7. Staff in my work unit take pride in my accomplishments 1 2 3 4 5
8. Staff in my work unit value my contribution to the well-being of the group 1 2 3 4 5
9. Staff in my work unit show little concern for me 1 2 3 4 5


C. The next questions are concerned with professional development, decision-making, goal clarity, and morale in your work unit.

1. I am encouraged to pursue further professional training and development
   - Strongly Disagree: 1, 2, 3, 4, 5

2. The goals of the work unit are not easily understood
   - Strongly Disagree: 1, 2, 3, 4, 5

3. There are forums in this work unit where I can express my opinions and views
   - Strongly Disagree: 1, 2, 3, 4, 5

4. There is a lot of energy in this work unit
   - Strongly Disagree: 1, 2, 3, 4, 5

5. Staff are frequently asked to participate in decisions concerning administrative policies and procedures in this work unit
   - Strongly Disagree: 1, 2, 3, 4, 5

6. The professional training and development planning in this work unit take into account my individual needs and interests
   - Strongly Disagree: 1, 2, 3, 4, 5

7. Staff are committed to this work unit's goals and values
   - Strongly Disagree: 1, 2, 3, 4, 5

8. Staff go about their work with enthusiasm
   - Strongly Disagree: 1, 2, 3, 4, 5

9. There is an opportunity for staff to participate in work unit policy and decision making
   - Strongly Disagree: 1, 2, 3, 4, 5

10. It is not difficult for staff to gain access to training courses
    - Strongly Disagree: 1, 2, 3, 4, 5

11. This work unit has a clearly stated set of objectives and goals
    - Strongly Disagree: 1, 2, 3, 4, 5

12. Staff take pride in this unit
    - Strongly Disagree: 1, 2, 3, 4, 5

D. The final set of questions in this section of the survey ask you to think about a range of issues including role clarity, professional interaction, appraisal and recognition, workload, and workplace distress in your work unit.

1. I am always clear about what others expect of me
   - Strongly Disagree: 1, 2, 3, 4, 5

2. I am encouraged in my work by praise, thanks, or other recognition
   - Strongly Disagree: 1, 2, 3, 4, 5

3. Staff in this work unit feel anxious about their work
   - Strongly Disagree: 1, 2, 3, 4, 5

4. I feel accepted by others in this work unit
   - Strongly Disagree: 1, 2, 3, 4, 5

5. There is too much expected of staff in this work unit
   - Strongly Disagree: 1, 2, 3, 4, 5

6. Staff in this work unit are frustrated with their jobs
   - Strongly Disagree: 1, 2, 3, 4, 5

7. I have the opportunity to be involved in cooperative work with other members of staff
   - Strongly Disagree: 1, 2, 3, 4, 5

8. I am happy with the quality of the feedback that I receive on my work unit
   - Strongly Disagree: 1, 2, 3, 4, 5

9. My work objectives are well defined
   - Strongly Disagree: 1, 2, 3, 4, 5

10. Staff in this work unit are overloaded with work
    - Strongly Disagree: 1, 2, 3, 4, 5

11. There is a lot of tension in this work unit
    - Strongly Disagree: 1, 2, 3, 4, 5

12. Staff receive recognition for good work
    - Strongly Disagree: 1, 2, 3, 4, 5

13. There is no time for staff to relax in this unit
    - Strongly Disagree: 1, 2, 3, 4, 5

14. I am clear about my professional responsibilities
    - Strongly Disagree: 1, 2, 3, 4, 5

15. There is good communication among staff in this work unit
    - Strongly Disagree: 1, 2, 3, 4, 5
Effects of co-workers’ extra-role behaviour

PART 3

Individual attributes

This section of the survey is concerned with your attitudes and experiences in the workplace. Please respond on the basis of your own experiences in the workplace.

A. The following questions are concerned with how committed you are to your work unit:
   1. I feel a strong sense of belonging to my work unit
   2. I really feel as if this work unit’s problems are my own
   3. I feel emotionally attached to my work unit

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<th>Strongly Disagree</th>
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B. The next questions are concerned with how satisfied you are:
   1. Overall, I am satisfied with the kind of work I do
   2. Overall, I am satisfied with the organization in which I work
   3. Overall, I am satisfied with my job
   4. I feel fairly paid for the amount of effort I put into my job
   5. Compared to other places, I could work, I am fairly paid for my effort
   6. Compared to other places, I am fairly rewarded for work that is done

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C. The next questions ask you to consider your openness to change:
   1. I consider myself to be "open" to work unit changes
   2. Right now I am somewhat resistant when changes are proposed
   3. I look forward to changes in my work role
   4. I am reluctant to consider changing the way I do my work
   5. From my perspective, proposed changes are often for the better

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D. The following questions ask you to consider how committed you are to the Department of Main Roads as a whole:
   1. This organization has a great deal of personal meaning for me
   2. I really feel as if Main Roads’ problems are my own
   3. I feel a strong sense of belonging to Main Roads

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E. The following questions address work-home conflict:
   1. Does your job interfere with your responsibilities at home?
   2. Does your job keep you from spending the amount of time you would like to spend at home?
   3. Does your home life interfere with your work responsibilities (e.g., getting to work on time)?

<table>
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<tr>
<th>Very Little</th>
<th>A Great Deal</th>
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Effects of co-workers’ extra-role behaviour

This section of the survey asks you to consider how effective you and your work unit are on a number of indicators.

A. The first set of questions asks you to consider your role in your work unit over the last six months. To what extent have you:

1. Provided help to coworkers when asked, or needed
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
2. Dealt effectively with changes affecting your work unit (e.g., new members)
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
3. Coped with changes in the way your unit works
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
4. Responded constructively to changes in the way your unit works
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
5. Initiated better ways of doing your core tasks
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
6. Came up with ideas to improve the way your core tasks are done
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
7. Made changes to the way your core tasks are done
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
8. Helped orient new co-workers
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
9. Helped co-workers learn about the work
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
10. Spoke up about issues that I thought were important for the work unit
    - 1 Very Little
    - 2 Little
    - 3 Somewhat
    - 4 A Great Deal
11. Spoke up about issues that I thought were important for the work unit
    - 1 Very Little
    - 2 Little
    - 3 Somewhat
    - 4 A Great Deal
12. Brought up issues about the work unit that I feel a need to discuss, even when I know others will disagree with me
    - 1 Very Little
    - 2 Little
    - 3 Somewhat
    - 4 A Great Deal

B. If you work directly with clients, please rate the extent to which you:

1. Understand the needs of clients
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
2. Know the different needs of clients
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
3. See things from the client’s point of view
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
4. Put yourself in the shoes of the clients
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal

C. The next set of questions in this section is concerned with absence from work. Please respond to the following two questions in the spaces provided.

1. Approximately how many days sick leave did you take during the last 6 months without a certificate?
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal

2. Approximately how many days sick leave did you take during the last 6 months with a certificate?
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal

D. The following questions ask you to think about your plans for staying in your current job. Please circle the number that best matches your response to each question.

1. Do you seriously intend to seek a transfer to another job in the near future?
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal

2. Do you seriously intend to resign from your job during the near future?
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal

3. Do you seriously intend to apply for a job in a different occupation in the near future?
   - 1 Very Little
   - 2 Little
   - 3 Somewhat
   - 4 A Great Deal
APPENDIX C: EXPERIMENTAL MATERIALS FROM CHAPTER 7
Ant-Hill

In the Ant-Hill study we are interested in how people form opinions about the organizations they work for. These opinions are often formed soon after joining, and on the basis of very small amounts of information.

Imagine that you have just joined Ant-Hill, a manufacturer of sunglasses. Read the description of the firm, and a typical day within it, and then answer the questions that follow.
Ant-Hill

Ant-hill Eyewear is a Brisbane based company that designs, manufactures and markets sunglasses. The organisation was formed in 1976. It has a reputation for making high quality sunglasses for use in casual and competitive sports. In 2002, Ant-hill provided sunglasses to the Australian Netball Team, and the Australian Institute of Sport Rowing Team. Ant-hill sports sunglasses retail from $20 to $600.00.

Ant-Hill's top selling “Shark” sunglasses.

Ant-hill went public in 1998, raising just under 40 million dollars. The money was used to acquire a number of other sunglass manufacturers. The proceeds were also used to develop the “Hot Image” range of sunglasses, which is targeted at the lower end of the market (under $50.00). Further acquisitions were made in 1999 and 2000. Ant-hill now distributes approximately 70 brands of sports sunglasses, and manufactures over 50 sunglasses of its own design. As of 1999 Ant-hill sold sunglasses through international distributors in 14 counties, including the USA, Japan, Great Britain, and Indonesia.

Ant-hill currently employs 300 staff in offices in Brisbane, Sydney, Melbourne and Adelaide. The head office is in Brisbane, and includes divisions managing manufacturing, sales & marketing, distribution, and corporate services such as finance and HR. The company maintains three design and engineering studios, one in Sydney and two in Brisbane, and operates two manufacturing plants in Brisbane. The organisation also maintains sales and distribution staff in the USA, Great Britain and Japan.
Your Work at Ant-Hill

You have just joined Ant-Hill as an assistant account manager in the Distributor Relations Section. You report to Lyn, who is responsible for reaching distribution agreements with retailers in the South-East Asia region. You also work alongside Greg, who is at the same level as you, and has been with the firm for two years.

You usually turn up for work at around 6:30am and get started on proofreading completed contracts. Lyn gives you a lot of this work, as you are new to the organization and still learning. You’ve found that early mornings are the best time to get this kind of thing done, because the office becomes quite busy with constant enquiries and errands later in the day. Greg usually arrives by about 8:00. Most of his work involves checking the legal aspects of contracts, as he has a strong background in contract law. Greg previously worked as Lyn’s only assistant, but you were hired when the amount of work increased. You had heard that Greg has a reputation for being tough but hardworking. He had always been nice to you, but it was often difficult to tell what he thought.

On most days you work steadily till about 10:00, when Lyn usually has a catch-up meeting with you and Greg. At this time any issues or troubles either of you have are dealt with. Lyn always gets through these meetings very quickly, and sometimes can be a bit abrupt. Most days you have lunch at your desk, and work through till 5:00pm or 6:00pm. During the afternoon you often get people from different parts of the organization calling you on the phone to find out how well various distributors are doing.

A Typical Interaction

We will be asking some questions about your perceptions of Ant-hill, your boss, and Greg. These will be based on the description above, and the interaction described below PLEASE READ CAREFULLY

One afternoon, Lyn met with you and Greg and said that she had some contracts that needed to be drafted – she assigned one to Greg and one to you. Both of them were for distributors in Indonesia, who would be selling the low cost (under $50.00) Hot Image range of glasses. You started work on your contract as Greg began working on his. While working on his contract, Greg mentioned that he had been trying to convince people in the company that the Hot Image range would not be a big seller in the South East Asia region, and that the sales plans for that area should therefore be changed. You took notice of this, because it was not really a “formal” part of Greg’s job to be making these kinds of suggestions for change. Also, you and most of the other staff thought the Hot Image line would do very well. Later in the day you overheard Greg talking to a co-worker. “I’ve been trying to convince people that the Hot Image line is not right for our area.” he said, “I let people know what my true opinions are, even when they may disagree. I happen to know that the boss likes that kind of behaviour and looking good to the boss is what it’s all about.”
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Survey: The following questions are designed to gather your impressions of Ant-Hill, Greg (your co-worker), and Lyn (your boss). Please complete all the questions.

Part A: Identifier

You would have written down an identifier on your last survey. Please write the same information here:

1. The first two letters of your father’s first name: 
2. The day of the month you were born on (e.g. 28th): 
3. The last two numbers of your home phone number: 
4. The first two letters of your mother’s first name: 

Part B: About Ant-Hill

Please rate the extent to which you believe the following statements describe the work environment at Ant-Hill. If you find it difficult to answer, just indicate what you think is most likely, given the information you have. Indicate your agreement with each item using the following scale:

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<th>Strongly Disagree</th>
<th>Neither agree nor disagree</th>
<th>Strongly Agree</th>
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**Employee Morale**
1. People Ant-Hill are enthusiastic about their work  
2. People in Ant-Hill feel positive about their work  
3. People in Ant-Hill have a great deal of energy to put into their work

**Cooperation & Support**
3. People in Ant-Hill cooperate to get the job done effectively and efficiently  
4. People in Ant-Hill provide support to others in the organization  
5. There is good communication among staff at Ant-Hill  
6. Staff in Ant-Hill work well together
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**Satisfaction**

7. Overall, Ant-hill employees are satisfied with the kind of work they do 1 2 3 4 5 6 7
8. Overall, Ant-hill employees are satisfied with the organisation 1 2 3 4 5 6 7
9. Overall, Ant-hill employees are satisfied with their job 1 2 3 4 5 6 7

**Autonomy at work**

10. Employees at Ant-hill have freedom over how they do their jobs 1 2 3 4 5 6 7
11. Employees at Ant-hill have authority to act and make decisions about their work 1 2 3 4 5 6 7
12. Employees at Ant-hill decide on their own methods of working 1 2 3 4 5 6 7

**Leadership**

13. Managers at Ant-hill consider their employees’ personal feelings when implementing actions that will affect them. 1 2 3 4 5 6 7
14. Managers at Ant-hill take into account their employees’ personal needs. 1 2 3 4 5 6 7
15. Managers at Ant-hill ensure the interests of employees’ are considered when making decisions 1 2 3 4 5 6 7

**Organizational Success**

16. Ant-hill is a successful organization 1 2 3 4 5 6 7
17. Ant-hill can expect positive financial results 1 2 3 4 5 6 7
18. Ant-hill will grow in the future 1 2 3 4 5 6 7
Justice

19. Employees at Ant-hill are treated fairly by the organization.
   Strongly Disagree Neither agree nor disagree Strongly Agree
   1 2 3 4 5 6 7

20. Employees at Ant-hill can trust the organization.
   1 2 3 4 5 6 7

   1 2 3 4 5 6 7

Openness

22. Employees at Ant-hill are able to bring up problems and tough issues
   1 2 3 4 5 6 7

23. It is safe for employees to take a risk in Ant-hill
   1 2 3 4 5 6 7

24. If someone at Ant-hill made a mistake, it would be held against them
   1 2 3 4 5 6 7

Part C: Would you work at Ant-hill?

1. I would be very interested in applying for a job at Ant-hill
   1 2 3 4 5 6 7

2. If a position at Ant-hill became available, I would put a great deal of effort into applying for the job
   1 2 3 4 5 6 7

3. Working at Ant-hill would be better than working for most other organizations
   1 2 3 4 5 6 7
Part D: About Greg

The following questions refer to your perceptions of Greg, your co-worker in your new job. If you find it difficult to answer, just indicate what you think is most likely, given the information you have.

Work Activities. Please rate how often you think GREG would engage in the activities below within Ant-Hill, by circling the appropriate number:

Never 1 2 3 4 5 6 7 Always

Greg would…
1. Carry out the core parts of his job well 1 2 3 4 5 6 7
2. Complete his core tasks well, using the standard procedures 1 2 3 4 5 6 7
3. Ensure his tasks are completed properly 1 2 3 4 5 6 7
4. Provide assistance to coworkers when asked, or needed 1 2 3 4 5 6 7
5. Help orient new workers 1 2 3 4 5 6 7
6. Help co-workers learn about the work 1 2 3 4 5 6 7
7. Risk disapproval from co-workers to express his beliefs about what’s best for Ant-Hill 1 2 3 4 5 6 7
8. Speak up about issues that he feels are important 1 2 3 4 5 6 7
9. Bring up issues which he feels a need to discuss, even when he knows others will disagree with him 1 2 3 4 5 6 7

The following words could be used to describe GREG. For each scale, please indicate which word you think is most descriptive, by circling the appropriate number.

Altruistic -4 -3 -2 -1 0 1 2 3 4 Self-Centred
Devious -4 -3 -2 -1 0 1 2 3 4 Genuine
Honest -4 -3 -2 -1 0 1 2 3 4 Deceitful
Innocent -4 -3 -2 -1 0 1 2 3 4 Manipulating
Intelligent -4 -3 -2 -1 0 1 2 3 4 Stupid
Shy -4 -3 -2 -1 0 1 2 3 4 Outgoing