Work and Well-being in Teams

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Abstract

This thesis examines work and well-being in relationship to teamwork in two organisations employing professionals; one organising work in Japanese style teams and one with self-managing work teams. It offers a critique of current research on employee well-being in teams and outlines some ways forward for filling in the gaps in existing research.

Using two case studies, the working conditions may be in teamwork organisations are investigated. Second, the moderating effects of teamwork on the relationship between working conditions and employee well-being are investigated. Third, this thesis examines which aspects of teamwork may have a particularly strong moderating effect on the relationship between poor management and employee well-being, with a particular focus on the claim that social support is the main reason why working in teams may improve employee well-being. Finally, following on from the results of the moderating effects, the importance of opportunities for learning and innovation and supportive management for employee well-being are investigated in self-managing work teams.

The conclusion of this thesis is that implementing teamwork in organisations may only have limited benefits for employee well-being. Where such effects are found they can be explained by sources of social support and team support for innovation. Finally, it was found that whilst working in self-managing work teams predicts opportunities for learning and innovation, the relationship between such opportunities and employee well-being are mediated by a supportive management. The results of this thesis are discussed in view of the importance of conducting detailed risk assessments and how teamwork should be best supported to achieve the potential benefits of working in teamwork organisations.

Keywords: teamwork, employee well-being, innovation, risk assessment

Preface

During my years as a Masters student in Denmark, I was working as a research assistant for Professor Mogens Agervold at the University of Aarhus. One of the projects I was involved with was a qualitative study of self-managing work teams in Denmark where I, along with another colleague, interviewed managers, union representatives and employees in nine organisations in Manufacturing in Denmark to explore their experiences with such teams. This spurred my interest in self-managing work teams and other kinds of teamwork and how employees react to working in such teams.

This led me to apply for the PhD at the University of Nottingham and, after a few months, Professor Tom Cox offered me a job as a research assistant, working on a risk management project in a major international car design and manufacturing company, case study A in this thesis. I worked on this project with Professor Tom Cox and Professor Amanda Griffiths, who were also my thesis supervisors. Whilst this was my main responsibility, I was also involved in work on other projects, among others, the major international petrochemical company described in this thesis as case study B. The team consisted of Professor Tom Cox, Professor Amanda Griffiths, Dr Louise Thomson and Joanna Pryce. Although the risk management projects were run as teamwork, the present thesis developed from my own work on these projects. All, or a great part of, the fieldwork was conducted by myself in the two organisations, and the data analyses presented here were my sole responsibility. Further, the main focus of the teams was to carry out risk management whereas the theoretical and methodological work presented in this thesis represents my contribution to research on employee well-being in teamwork.

The main aims of this thesis are to contribute to existing research on employee well-being in teamwork. It examines how working conditions may be influenced by working in teams, both in terms of what the overall working

conditions are for employees working in teams but also whether working in a team moderates the relationship between poor working conditions and employee well-being. Further, it is investigated whether any specific aspects of working in a team may have particularly strong buffering effects. Finally, the thesis examines the way in which opportunities for learning and innovation, one of the key aspects of teamwork, are related to employee well-being and whether contextual factors, such as management support, may influence this relationship.

Chapter 1 outlines a general introduction to the nature and definition of teams and how teamwork differs from groupwork. It describes the concept of employee well-being as it is defined in this thesis. Chapter 2 outlines the history and theory of teamwork and offers a critical review of existing research on employee well-being in teams, focusing particularly on the limitations of this research. Chapter 3 briefly outlines the risk management framework, which was followed in the data collection process and the underlying participatory principles of the framework. It then describes the two organisations under study with a detailed description of the type of teamwork in each organisation and a discussion of how this kind of teamwork differs a) from other types of teams and b) from each other.

Chapter 4 examines the current theory on how working in teams may influence working conditions. This is followed by a description of the health profile of employees working in the two organisations. Second, the negative and positive aspects of the work are described as identified by team workers in the two case studies. These are related to existing theory of psychosocial hazards in the two types of teamwork. Finally, it is discussed whether any of the differences between the two case studies may be due to the type of teamwork applied in the two organisations.

Chapter 5 explores the possible moderating effects of team interdependence on the relationship between working conditions and employee well-being. Well-being is measured in terms of job satisfaction, tension/anxiety and exhaustion.

It is argued that working in teams has a limited impact on employee well-being and when it does have an impact it buffers specific predictors depending on the specific outcome.

Chapter 6 examines the buffering effects of team climate as a measure of the quality of teamwork or team processes on the relationship between management support and employee well-being. To identify which aspects of team climate may prove to have an especially strong effect, team climate is divided into its four sub-components. Chapter 7 considers the relationship between working in SMWTs and opportunities for learning and innovation and how this relates to employee well-being. It also explores the possible role of managers that actively support such innovation may play. The results are discussed with regard to the broader implications for organisational design and the management of work.

Chapter 8 summarises the findings from previous chapters and provides further consideration of their relevance to the management of employee well-being in teams. It draws conclusions about the usefulness of implementing teams and self-managing work teams in improving employee well-being and makes recommendations based on the conclusions. It considers the limitations of the research carried out in this thesis and recommendations for future research and the practical implications of this research.

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These acknowledgements are in no particular order. There are many people who have supported me in the production of this thesis.

First, I am grateful to the management and participants in the two case study organisations, without whom this thesis would not have been possible.

I would also like to thank my supervisors, Professor Tom Cox CBE and Professor Amanda Griffiths, for their guidance, support and encouragement throughout my time at the University of Nottingham. I am also grateful to the team of researchers who have been involved in the various risk management projects over the past three years: Dr Louise Thomson, Dr Raymond Randall, Joanna Pryce and Dr Eusebio Rial-González for their advice and support. Also thanks to the rest of I-WHO: Dr Fehmidah Munir, Dr Diane Beale, Mary Tisserand, Jonathan Houdmont and Dave Jones for trying to teach me English and stats. I have learned a lot from you guys, thanks!

On a personal note, I would like to thank my parents whose sacrifices enabled me to grasp opportunities they never had. I am forever grateful to Adry, Jan Jo and my favourite Spaniard for helping me through difficult times. And finally thanks to Jonas for giving me the confidence to embark on a PhD!

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1. Introduction

This thesis considers how employees react to two types of teamwork, Japanese style teams and self-managing work teams (SMWTs), with a particular focus on how these types of teamwork influence employee well-being. The research was carried out in two multinational companies employing professionals. This chapter provides a general introduction to teamwork, the nature and characteristics of teamwork, its prevalence, and the concept of employee well-being and how this is related to teamwork.

In recent years, vast changes have taken place that have had an impact on the modern workplace in terms of global markets, new flexible technologies and socio-political developments. In order to respond effectively to the demands these changes put on the organisation, there has been an increasing interest in alternative ways of designing work. Reorganising work is thought to improve organisational performance, productivity and quality, and enable organisations to respond quickly to changes in the environment, provide customised products and services whilst at the same time ensuring a high quality outcome (Parker & Williams, 2001; Sprigg & Parker, 1998; Wright & Edwards, 1998; Lawler, Mohrman & Ledford, 1992). One such way of ensuring the organisation's survival is to implement teamwork (Cohen, Chang & Ledford, 1997; Guzzo & Dickson, 1996; Becker-Reims, 1994; Cotton, 1993; Pearson, 1992). This approach is widely acknowledged within the framework of Human Resource Management, reflecting an understanding that "business as usual" no longer works (Appelbaum & Batt, 1994). Understanding teamwork is an important part of understanding the contemporary workplace (Hodson, 1997).

Introducing teamwork in organisations has been found to be beneficial in two ways: First, it may lead to improvements in productivity, quality, cost reduction, faster throughput time, improved decision making and innovation. Second, it may improve the organisations' ability to attract and maintain

qualified labour, reduce absenteeism and downsizing and create more satisfied and committed employees (Parker & Williams, 2001; Benders, Huijgen, Pekruhl & Kelly, 1999; Karasek & Theorell, 1990). A key goal of implementing teamwork is to promote organisational learning, which can sustain productivity and quality improvements (Thompson & Wallace, 1996). Further, improved performance is thought to be brought about by more rapid decision making delegated to team members and exploiting existing and developing employees' skills and knowledge (Banker, Field, Schroeder & Sinha, 1996; Cordery, 1996).

Teams, and especially SMWTs, are thought to be effective for several reasons (Yeatts & Hyten, 1998):

1. Team members are experts in their jobs and know how to complete the task efficiently.
2. Team members have the skills and knowledge of the overall team task and therefore such knowledge and skills are not lost when members are absent or leave the team.
3. As team members are multiskilled, they can help each other in times of high pressure.
4. Team members can allocate tasks to match the needs and abilities of individual team members.
5. Team members have an in-depth understanding of the task completion process and can therefore plan the work schedule accordingly.
6. Team members are believed to be more understanding of each other when they understand each other' jobs.
7. There is less need for management positions as teams carry out many of the responsibilities traditionally borne by middle management.

Teamwork encourages listening, facilitates perspective taking, provides support and facilitates the understanding of other team members' skills and expertise (Katzenbach & Smith, 1993).

Cotton (1993) conducted a meta-analysis of 156 studies on teamwork, of which only six reported negative findings in terms of productivity, satisfaction or absenteeism and seventeen found no changes in these measures. Van Houten (1987) emphasised the early implementations of SMWTs in Sweden (see section 2.2.3) as an opportunity to share decisions about work organisation, which may lead to employers benefiting from employees' everyday knowledge about machinery, materials and production processes and workers get to shape the design of new arrangements to improve working conditions. However, many organizations have discovered that teamwork may not bring about the positive effects anticipated. Although teamwork offers opportunities for learning and innovation, and improved quality and efficiency, this potential is not always realised or negative side effects may be found in terms of internal conflicts and increased turnover (Jackson, 1996; Cohen & Ledford, 1994; Goodman, Devadas & Hugson, 1988). Yeatts and Hyten (1998) concluded that many cases where no positive effects had been found could be accounted for by a lack of support from management and the organisational context in the form of inadequate reward systems, lack of training and poor team design. Research carried out in this field has concentrated on the effects on organisational measures and less attention has been paid to the possible effects on employee well-being (Parker & Wall, 1998; Cordery, 1996; Cotton, 1993). It is likely that this type of job design also has profound effects on employee health and well-being (Parker & Williams, 2001; van Mierlo, Rutte, Seinen & Kompier, 2001).

1.1 Groups, Teams or Self-Managing Work Teams?

Before proceeding, it may be useful to define Japanese style teams and self-managing work teams, how the two differ from other types of groupwork, and how they differ from each other. Katzenbach and Smith (1996; 1993) have defined a team as:

> "a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable."

The focus on organisational performance is emphasised in definitions of team working, as can be seen in the description used by Procter and Currie (2000, p. 254). They define team working as:

> "A management strategy for the organization of work, the aim of which is to improve organizational performance through the creation of interdependencies within small groups of workers."

This definition is interesting for two reasons: a) The aim of introducing team working is to improve organisational performance and b) the main characteristic of teamwork is the interdependency of team members. Although Procter and Currie (2000) acknowledge that team working can be one way of improving quality of working life, they do not consider this an aspect of the management strategy. Indeed, they claim that due to the constrained economic systems since the 1970s, teamwork is now introduced for economical reasons rather than concerns for employee well-being. However, other research has shown that there are cases in which teamwork has been introduced to improve the quality of working life (Nielsen, 2000; Netterstrøm, 1999; Terra, 1995). Therefore, it seems unreasonable to state in a definition of teams that implementing teams serves only one purpose. Indeed, Cartwright, Cooper and Murphy (1995) state that the current success and financial health of an organisation is not necessarily a good predictor of future performance. The future performance and organisational healthiness is very much dependent upon the physical and psychological health of the members of the organisation (Cox, 1993). Rather, it seems more important to follow a definition that is concerned about the nature of teamwork rather than the desired outcomes that may or may not be achieved. The following definition has been adopted from Firth-Cozens, 1998; Cohen and Bailey, 1997; West, 1996; Guzzo and Dickson, 1996; Cohen and Ledford, 1994; Sundstrom, DeMeuse and Futtrell,

1990; Hackman and Oldham, 1980. It contains three dimensions related to the core characteristics of teams:

- Task interdependence. Team members depend on each other for carrying out the team's task. Team members are dependent on collaborating, if they are to complete their own individual tasks, as they are part of a larger task.
- Purpose. The team is responsible for carrying out a whole, identifiable task. The result being that team members are able to establish and recognise the borders between the team and others and as such they form a coherent team. They act as a formally constituted, permanent team of employees who interact directly to perform a relatively complete set of interdependent tasks. This has also been termed outcome interdependence (Van der Vegt, Emans, & van de Vliert, 2001; 1998).
- Multiskilling. Team members are trained so they can help each other out or replace other team members, if necessary. Thus the individual's skills are not lost in cases of absence or turnover but embedded in the team's shared knowledge base. Cordery (1996) outlines two forms of multiskilling: horizontal multiskilling, where team members are able to perform several of the tasks relevant to carry out the team's purpose, i.e. technical skills, and vertical multiskilling, where team members are empowered to carry out management tasks.

In some definitions, the team size is included. It has been argued that an appropriate size ranges from 5 – 15 (Yeatts & Hyten, 1998, Cotton, 1993). However, size is not included in this definition, as there is no definite size. What is important to note is that team size should be the smallest possible for carrying out the task (Katzenbach & Smith, 1993) and that larger teams may often divide into sub-teams with ensuing conflicts and tension (Nielsen, 2000).

Parker and Williams (2001) included in their definition of teams that the team must have shared objectives or goals. This is compatible with the above mentioned outcome interdependence in that team members have a specific purpose or goal towards which they work.

Increasingly popular is the notion of teams rather than groups (Guzzo, 1996). It is important to make a clear distinction between groups and teams, as they do not share the same characteristics. A characteristic of groups is that the group does not necessarily work on a joint task. A working group's performance is a function of what the members do as individuals: a team's performance is a result of team members' individual results but importantly also of what Katzenbach and Smith (1993) call "collective work-products", this refers to the result when two or more people must work together; it represents the joint result of team members. Working groups may work together but the focus is on individual goals, performance and results, members of work groups do not share the responsibility for successful results. Teams produce discrete products through the joint contribution of their members.

Further, groups co-act rather than interact and they neither depend on each other for carrying out the task nor do they need to be responsible for a whole product or service. Guzzo (1996, p. 8) has made the following comment on the distinction between groups and teams:

> "I suggest the following convention: what can be said is that all teams are groups but not all groups are teams. Not all groups are teams because the term group has indeed been used very expansively in general social science, for example to describe social aggregates in which there is no social interdependence of members."

A number of different types of teams have been identified. Many of the problems in teamwork research seem to arise from the term being used too generically to cover a variety of different concepts and practices such as

quality circles, TQM, lean production, teams, SMWTs (Banker, Field, Schroeder & Sinha, 1996; Thompson & Wallace, 1996) (See chapter 3 for an in-depth description of different kinds of teams). The two main distinctions relevant for this thesis are those of teams that perform a core task (Procter & Currie, 2000; Benders et al, 1999). Below are described the difference between the two types of teamwork under investigation in this thesis.

Japanese team structure is characterised by the team aspect, i.e. the need for employees to work together to complete a task over which they have joint responsibility. These teams are often referred to as lean or Toyotist teams or simply as teams. The experience of being a member of a team and working closely with others seem to be the predominant features of working in a (Japanese) team, encompassing the opportunities for social support and applying multiple skills which this implies (Procter & Currie, 2000; Firth-Cozens, 1998).

Self-managing work teams (SMWTs) are characterised inter alia by the high degree of autonomy delegated to workers. This type of team was first inspired by Trist and Bamforth (1951). This type of team has been known under a variety of names: self-managing work teams, socio-technical teams, autonomous work groups, semi-autonomous work groups, self-directed or self-regulating teams, high-performing teams, empowered teams or Scandinavian teams; Norway, Sweden and the Netherlands have been dominant in research and application of this kind of team (Agervold, 1998; Cohen & Bailey, 1997; Thompson, & Wallace, 1996; Glaser, 1992). Ulich and Weber (1996) conducted a review of which tasks SMWTs would typically take over. They found that most authors agreed that SMWTs should be responsible for making decisions regarding their day-to-day tasks such as job allocation, time planning, quality control, basic maintenance and procedures for carrying out the task. These are the responsibilities which differentiate them from other kinds of teams. However, these responsibilities are only the lower limit of what self-managing work teams can take on. Susman (1976) categorises the autonomy that SMWTs can have into three types:

- Autonomy regarding "decisions of self-regulation" i.e. the day-to-day management of tasks including job allocation, quality control, maintenance of equipment and time planning.
- Autonomy of independence which concerns control over the order in which work will be performed and control over the overall strategic direction of work. In other words the degree to which the team depends on others for carrying out their own task and decide their own performance strategy.
- Autonomy of "self-governance", which concerns the "people management" of the team e.g. as how meetings are held and when, who belongs to the group and who leads the group, etc.

Gulowsen (1971) and Ulich and Weber (1996) describe a number of additional tasks that a SMWT can take over in greater detail: Responsibility over qualitative and quantitative goals, appointing external leaders, the task, deciding on working hours, deciding on the layout of the production area, buying new equipment within a budget. However, they emphasise the importance of gradually allocating these responsibilities to teams: implementing SMWTs is very much a continual process where SMWTs develop and mature over time.

Research seems to indicate that the important aspects of working in SMWTs are concerned with increased autonomy and improved social relations (Nielsen, 2000; Melin, Lundberg, Söderlund & Granqvist, 1999; Cordery, 1996; Cordery, Muller & Smith, 1991; Karasek & Theorell, 1990; Wall, Kemp, Jackson & Clegg, 1986; Trist, Susman & Brown, 1977; Trist & Bamforth, 1951).

To summarise, the main difference between the types of teamwork is the degree of autonomy delegated to team members. The two types of teamwork share a number of characteristics but differ on others (see section 3.1.4). Both types of work design focus on direct participation as opposed to e.g. quality

circles. Neither of these have the improvement of employee health as the primary goal, whilst SMWTs approaches focus on employee well-being as a means to improve employee efficiency and productivity, Japanese style teams focus on developing the workers' skills to ensure organisational survival (Mikkelsen, 2000).

The differences between the two types of team is supported by Murikami (1997) who observed the above mentioned differences in a comparative study in nineteen automotive plants. Various degrees of team interdependence can be found within both types of teamwork.

In this thesis, the term "self-managing work team" (SMWT) is used to cover teams with a high degree of autonomy and the term "team" is used to cover Japanese style teams. Where no distinction is made, the term teamwork is used to cover both types of team.

1.2 Well-being in Teamwork

It has been widely assumed that introducing teamwork will have positive effects on employee well-being (van Mierlo et al, 2001; Steijn, 2000). However, little research has explicitly focused on how teamwork and the changed social relations they give rise to may influence employee well-being (Parker & Wall, 1998; Hodson, 1997; Sonnentag, 1996; Cotton, 1993). This is mainly due to the fact that research on teamwork and research into stress and well-being belong to two different research traditions, i.e. Human Resource Management and Occupational Health Psychology (Sonnentag, 1996). Further, teamwork research is usually carried out at the group level whereas employee well-being research is usually carried out at the individual level (Sonnentag, 1996).

Poor mental health and well-being is becoming an increasingly recognised issue of working life in recent years. For example, Smith, Wadsworth, Johal, Davey-Smith and Peters (2000) found that almost one in five workers reported experiencing either very or extremely high levels of stress in their work. In a

longitudinal study Kivimäki, Leino-Arjas, Luukkonen, Riihimäki, Vahtera and Kirjonen (2002) found that high job strain, low job control and an imbalance between the efforts put into the job and the rewards of the job were related to cardiovascular mortality.

Jones, Hodgson, Clegg and Elliott (1998) and Hodgson, Jones, Elliott and Osman (1993) suggested that work-related stress was the second most common occupational illness, second only to musculoskeletal disorders. They suggested that about 6.5 million working days were lost due to work-related stress illnesses in the UK every year; the annual costs were estimated to be around £3.7-3.8 billion in 1995-1996.

In recognition of recent research, it is a legal requirement within the EU (Health & Safety Commission, 1999; 1992) and UK (Health & Safety Executive, 1990) to conduct risk assessments of psychosocial as well as physical risks and aim to minimise the detrimental effects of poor working conditions on employee health and well-being. It is therefore important to build a framework where the effects of new ways of working, including teamwork, are thoroughly understood and implemented.

Various definitions of the stress concept have been adopted over time (Cox, 1993), however, in recent years psychological models, including the transactional model, have become dominant (Cox, 1993; Lazarus & Folkman, 1984). Lazarus' transactional model identifies two main questions: First, concerning primary appraisal: "What is at stake?" and second, secondary appraisal: "What can I do about it". Stress occurs when the individual perceives that something is at stake and he/she cannot cope with the situation, and that coping is important (Cox, 1993); the greater the imbalance between what the person can do about the situation and the demands put on the individual, the greater stress is perceived (Lazarus & Folkman, 1984; Lazarus, 1966). Levi (2001) includes in the transactional process the discrepancy between the individual's needs and the possibilities in the environment to

fulfil these needs, and the discrepancy between human resources and the demands put forward by the environment.

Cox (1993) identified nine categorised work characteristics that may have a detrimental impact on employee well-being if work is not adequately designed and managed. They have been defined as "those aspects of design and management of work, and its social and organisational context, that have the potential for causing psychological or physical harm" (Cox, Griffiths & Randall, 2003). Most research on work-related well-being has concentrated on the detrimental effects of work on employee well-being and health rather than on the positive effects of work (Sonnentag, 1996). However, Levi (2001) suggested that psychosocial factors should not only focus on the potential negative effects on health but also include consideration of factors which may be health-promoting i.e. lead to improved employee well-being. It is important not only to investigate the negative effects of working conditions, it is also important to examine the possible positive effects on employee well-being in general (Agervold, 1998). These nine factors identified by Cox (1993) are shown in figure 1.1. However, it is contended here that these factors may also be positive and have a positive impact on employee well-being, therefore the negative aspect has been eliminated by adopting a neutral wording of these nine categories in this thesis. One way of organising work, which incorporates these work characteristics in a specific pattern, is teamwork.

Warr (1987) distinguishes between context-free and job-related well-being. Job-related well-being is thought to include job satisfaction, commitment, job-related tension, job-related depression, burnout and morale. In this thesis the use of the term employee well-being refers to Warr's definition of job-related well-being.

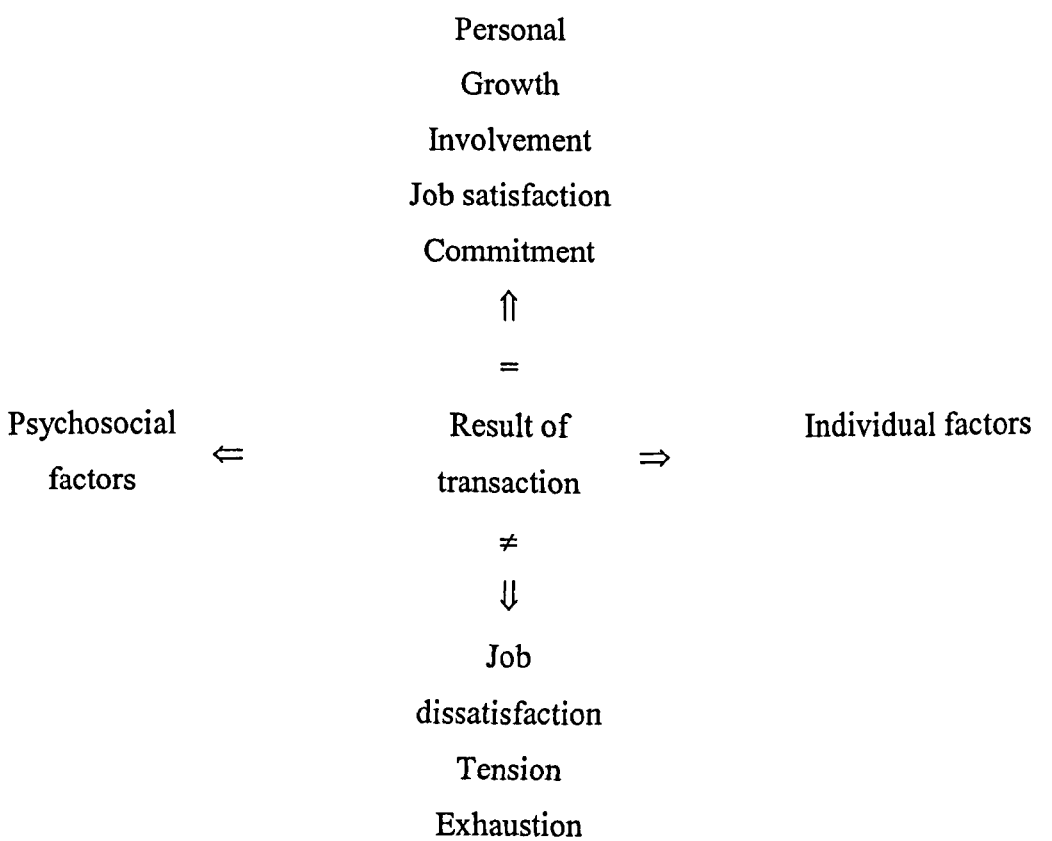
Figure 1.1 Work characteristics, adopted from Cox (1993)

Work Characteristics	Working conditions
Context	
Organisational function and culture	Task environment and definition of objectives Problem solving environment Development environment Communication Supportive culture
Role in organisation	Role clarity Role conflict Responsibility for people
Career development	Career certainty Career progression Status or status incongruity Pay Job security and redundancy Social value to work
Decision latitude/control	Participation in decision making Control over work Decision making in work
Interpersonal relationships at work	Social or physical contact Relationships with superiors Interpersonal conflict and violence Social support
Home/work interface	Demands of work and home Social or practical support at home
Work content	
Task design	Level of defined work Level of certainty in work Variety or work cycles Meaningfulness of work Utilisation of skills Continual exposure to client/customer groups
Workload/work pace	Control over pacing Workload Levels of pacing or time pressure
Work schedule	Shift work Flexibility of work schedule Predictability of work hours Length of or out-of-hours working hours

The model of well-being adopted in this thesis is that of Agervold (1998; 1991). It is based on the transactional stress model developed by Lazarus (Lazarus & Folkman, 1984; Lazarus, 1966). In order to incorporate the demands of the transactional model to address also positive psychosocial factors and employee well-being, Agervold (1998; 1991) has linked the stress

appraisal process with appraisal of whether a situation may offer opportunities for the individual to find the situation interesting, meaningful and whether he or she may benefit from being actively involved in the situation (see figure 1.2). If the individual appraises the situation as bringing about something positive this may in turn result in personal development, job involvement and satisfaction and commitment.

Figure 1.2: Simple transactional model, adopted from Agervold (1998)



Some apparent benefits have been hypothesised in relation to working in teams. Firth-Cozens (2000;1998) and Sonnentag (1996) have suggested that working in teams has been closely related to increased opportunities for social support and there is a widespread literature within occupational health psychology and related disciplines which investigate the possible buffering effects of social support on employee well-being (Leather, Lawrence, Beale, Cox & Dickson, 1998; Lim, 1997). As mentioned before, teamwork is assumed to provide employees with a feeling that they have meaningful jobs as they can see the results of their work and they have widespread

opportunities for learning and innovation (Ulich & Weber, 1996). However, negative effects have also been hypothesised (Parker & Wall, 1998; Parker & Whybrow, 1998) in terms of increased demands and time pressures (See chapter 4 for an in-depth description of the hypothesised effects of teamwork on employee well-being).

However, little research has been conducted to specifically address how working in teams influences employee well-being (Guzzo & Dickson, 1996; Cotton, 1993). Cordery (1996) highlights the need to understand how teams function internally and the need to find an explanation for their impact on work performance and employee well-being. Further, Parkes and Sparkes (1998) concluded in their review of organisational interventions of work stress that more sound research into the effects of teamwork was required. Sonnentag (1996) reviewed a number of studies on teamwork and employee well-being and concluded that, overall, teamwork has beneficial effects on employee well-being. But she also concluded that working in a positive team environment does not automatically increase employee well-being, other work characteristics must also be taken into consideration when assessing the positive effects of team working on employee well-being.

This thesis focuses on establishing how working in teams may influence employee well-being and what the possible mechanisms behind such an influence may be. In other words, does working in teams moderate the relationship between psychosocial hazards and employee well-being? If so, what are the mechanisms behind such a relationship? Also, how does teamwork relate to opportunities for learning and innovation? The role of management in teamwork is also investigated as an example of how the contextual environment should be considered when investigating teamwork.

2. A Review of Teamwork

This chapter outlines the history of teamwork and the theoretical background for teams and SMWTs. Subsequently it examines the research on employee well-being in teamwork and offers an overview of the limitations of current theory and research. Finally, it outlines the research questions for this thesis.

2.1 Theoretical Background for Implementing Teamwork

Three established theoretical approaches are believed to have had an impact on today's teamwork culture in modern organisations: The Social-Technical Systems (STS) approach, the Job Characteristics Model (JCM) and recent input-process-output models.

One of the first large-scale studies to shed light on teams or groups in organisations was the Hawthorne studies (Guzzo, 1996; Leavitt, 1975; Landsberger, 1958) carried out at the General Electrics factory in Hawthorne. Whilst carrying out a study intending to explore the effects of manipulating light levels and wage incentives on factory workers' performance, some extraordinary effects were encountered. Regardless of the illumination and wage structure used, the experimental group's performance increased. It was found that the effects were due to the informal group structure formed by the experimental group and by the fact that the group felt favoured by the researchers (Guzzo, 1996; Roethlisberger & Dickson, 1939). The main conclusions of the human relations school that the Hawthorne studies inspired were that a) creating positive relations was beneficial to increase performance and b) employees should be treated with respect and participate in decision making regarding their work (Yeatts, & Hyten, 1998).

2.1.1 The Socio-Technical Systems Theory

The Socio-Technical Systems (STS) development originated in the 1950s at the Tavistock Institute of Human Relations in London (Trist & Bamforth, 1951). The researchers at the Tavistock Institute were invited to investigate the problems of a coalmine where Scientific Management principles had recently been employed. Frederic Taylor (1947) developed the principles of Scientific Management in the early parts of the 20th century, the main principles being:

- Conducting thorough analyses of the job in hand and breaking this down in sub-tasks and defining the rules, laws and formulae that would define the best possible way to carry out the job leaving nothing to the discretion of the worker.
- Managers should plan the daily work of employees at least a day in advance describing in detail what should be done, how it should be done and the means by which it should be done.
- The job should be planned so carefully and the right person found for the job so that it would require no mental contribution for the worker.

These methods were applied in the coalmine with the work being redesigned into the so-called long-wall method where colliers worked individually in the mine along a long stretch of the mine. Each collier would be responsible for a separate aspect of coal production: boring, cutting, belt-breaking etc. Colliers would not necessarily be working close to each other but be spread over large areas in the mine (Trist & Bamforth, 1951).

However, the introduction of Tayloristic work methods did not have the expected positive effects on productivity, rather negative effects were found not only in terms of poor productivity but also in terms of increased turnover and absenteeism, despite improved equipment and higher wages. Further, the sequential breakdown of the process meant that each collier was dependent on others and if a breakdown occurred in one area the whole process came to an end. Further, it was found that one individual's errors or low performance

influenced others in a way which they were unable to control (Trist & Bamforth, 1951).

The researchers from the Tavistock Institute concluded that the traditional method of getting coal fulfilled the social and cognitive needs of colliers – needs that were no longer satisfied in the long-wall design. Previously, colliers had been working in pairs or threes and in some cases had formed larger groups of up to eight. Groups had been responsible for the whole process of getting coal, and thus carried out all tasks associated with this process. Based on their analysis, Trist and Bamforth (1951) concluded that all systems consist of two subsystems: (a) a social system comprising the relationship between employees and technology and the relationship between employees and (b) a technical system such as tools techniques, strategies, skills and knowledge. To ensure that a system functions optimally this should be joined for maximum effects such that systems are in balance. The implications of these findings were analysed and replicated in other studies (e.g. Rice, 1958) and led to the socio-technical systems school (Glaser, 1992). STS theory has been described as combining the human relations and scientific management schools as it emphasises the understanding of both the *social* and *technical* aspects of work (Yeatts & Hyten, 1998).

According to socio-technical theory (Cherns, 1976), a series of human needs need to be fulfilled to achieve productivity and employee well-being:

- The need for a reasonably demanding job which provides a minimum level of variety.
- The need to develop in the job through constant learning.
- The need for being able to make decision over one's own work.
- The need for social support and recognition.
- The need for the employee to relate to what he or she does and produces in his or her social life.

- The need to feel that the job holds an attractive future (not necessarily promotion).

Where the Hawthorne studies showed the power of having a group where none existed, the coalmine studies showed the effects of what happens when groups are broken down (Hackman, 1990). However, the STS approach has been criticised for providing little guidance on how to implement these principles (Hackman & Oldham, 1980).

2.1.2 The Job Characteristics Model

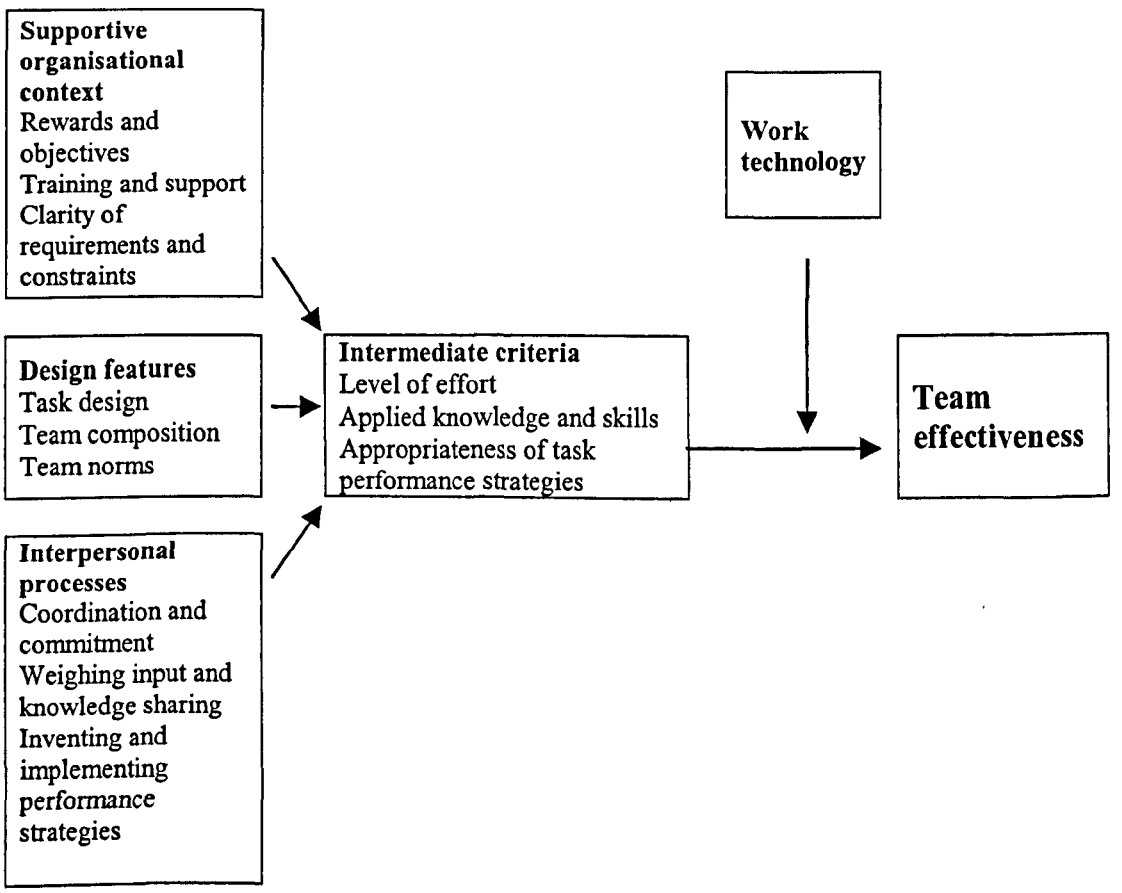
Hackman is seen as the father of the Job Characteristics Model (JCM) (Hackman & Oldham, 1980; 1975). According to his theory, work design has immense effects on job satisfaction, commitment, motivation and performance. In order to achieve these beneficial effects of work, five job characteristics should be present in jobs:

- *Skill variety.* The job should offer the employee ample opportunities for conducting a variety of activities in order to make use of their skills and abilities.
- *Task Identity.* Work should be organised in such a way that the employee has the opportunity to follow the product from beginning to end and identify with the final product.
- *Task Significance.* In order to experience the job as meaningful, the task should provide the employee with the feeling that the job has a significant impact on other people's lives.
- *Autonomy.* The employee should have the freedom to plan and carry out his/her job in order to feel responsible for the outcome.
- *Feedback from the job.* The employee should receive direct feedback on his/her performance in order to ensure quality and the opportunity to correct errors at source.

The principles of the JCM overlap with recommendations of STS and are easily achieved through self-managing work teams (Hackman & Oldham, 1980).

Hackman and colleagues (Hackman & Oldham, 1980) incorporated this in an input-process-outcome model (see figure 2.1), one of the first to incorporate the STS principles in a wider framework that could be applied for measuring team effectiveness (Yeatts & Hyten, 1998).

Figure 2.1: A model of team effectiveness, adopted from Hackman & Oldham, (1980)



Hackman listed three criteria for team effectiveness:

- *Productivity.* Team effectiveness can be measured in the degree to which the team meets or exceeds the quality and quantity standards set by the organisation.
- *Employee well-being.* A team cannot be considered effective if it does not fulfil the individual's needs.
- *Viability.* The social processes of the team should ensure that team members can work together in the future.

In order to ensure that teams are effective, Hackman identified three main sources of input: a supportive organisational context, work design features and interpersonal processes. These are described in detail below:

Supportive organisational context

- *Rewards and objectives.* Rewards should be distributed to team members based on overall team performance and objectives should be set for overall team performance.
- *Training and technical support.* Training programmes should be available through which team members can acquire the necessary skills, and technical support should be available to support the teams.
- *Clarity of task requirements and constraints.* The demands to the team should be made clear along with the constraints under which the team operates.

Design features

- *Design of the team task.* The task should be designed so that it contains the job characteristics described above: skill variety, task identity, task significance, autonomy and feedback.
- *Composition of the group.* In order to achieve effectiveness, the composition of teams should consider the following factors: a) The team should consist of team members with a high level of task relevant expertise, b) the team should have the sufficient number of people to carry out the job – no more than that, c) team members should possess interpersonal skills, and, finally, d) team members should have the appropriate match of skills and abilities so that not all members possess the same skills and abilities but should at the same time have a minimum common ground to ensure that they can work together.
- *Team norms.* Teams should have developed appropriate norms and performance strategies for completing the task.

Healthy interpersonal processes

- *Coordinating efforts and fostering commitment.* Team members should work together as a close unit and communicate clearly.
- *Weighing inputs and sharing knowledge.* Team members should select the appropriate information and knowledge in order to solve problems and complete the task.
- *Implementing and inventing performance strategy.* Team members should develop concrete performance strategies based on team objectives.

However, the relationship between input and output is not straightforward. Task design is thought to be influenced by the effort that team members bring to the task: task composition is influenced by the amount of skills and knowledge that team members apply when carrying out the task, and, finally, the relationship between team effectiveness and group norms is mediated by the appropriateness of performance strategies applied to the task.

It is strongly emphasised that teamwork should only be introduced in environments where it is appropriate and the culture is ready for this type of work design and where it involves employees with a strong need for personal growth (Hackman & Oldham, 1980). An important aspect of the JCM model is the understanding that employees are individuals with different needs and this type of work design may be especially appropriate for employees with a strong growth need (Yeatts & Hyten, 1998).

2.1.3 Input-Process- Output Models

In recent years, a number of models have been developed, which aim to explain the performance of teams and identify which factors may influence such performance inspired by the work of Hackman and colleagues (Yeatts & Hyten, 1998; Cohen & Ledford, 1994; Campion, Medsker & Higgs, 1993; Sundstrom, DeMeuse & Futrell, 1990; Pearce & Ravlin, 1987; Gladstein, 1984). These models are commonly referred to as input-process-output models, with input factors usually including individual-level factors, group-

level factors, task design factors and environment-level factors. Process factors usually include intra-group process factors. Outcome has been measured in a variety of ways such as productivity, quality, job satisfaction, commitment, customer satisfaction, absenteeism, turnover, safety, and viability. Yeatts and Hyten (1998) have provided an overview of the best known input-process-output models.

In this thesis, only two of the most influential models will be reviewed, namely those of Michael Campion and his colleagues and Susan Cohen and her colleagues (Campion, Papper & Medsker, 1996; Campion, Medsker & Higgs, 1993; Cohen, Chang & Ledford, 1997; Cohen, Ledford & Spreitzer, 1996; Cohen & Ledford, 1994). These have not only received a great deal of attention but have also been the subject of extensive validation research (Yeatts & Hyten, 1998).

Michael Campion's Team Effectiveness Model

Michael Campion and his colleagues presented and tested in 1993 and 1996 an extensive model of team effectiveness. The model built on several theoretical frameworks, including social psychology, socio-technical psychology, industrial engineering and organisational psychology. They found that a number of factors predicted team effectiveness measured as productivity, job satisfaction and managers' judgements of team effectiveness. Based on the above-mentioned schools, they included output measures such as job design, interdependence, team composition, and context and process issues such as team members' belief that they could succeed, social support, workload sharing and communication and co-operation within the teams. They found close relationships between the input and output factors, when using employee-reported measures but few relationships when they looked at managers' judgements. This led to the conclusion that managers may have little knowledge of what characteristics a team may have and how effective teams are in reality. Although team process factors were included in the model, their possible mediating or moderating effects were not examined.

Susan Cohen's Model of Effectiveness in SMWTs

Susan Cohen and her colleagues have developed a model for examining effectiveness in self-managing work teams. This model has been developed in several stages. In 1994, Cohen and Ledford published a paper in which they investigated the effects of SMWTs on satisfaction, organisational commitment, perceived positive change, and effectiveness as rated by supervisors and employees. Customer complaints and safety and withdrawal behaviours were also examined. They concluded that SMWTs were more efficient than traditional teams both in terms of quality of working life and productivity benefits in manufacturing. In 1996, Cohen, Ledford and Spreitzer developed a model in which they included input and process variables. As with Campion et al. (1996; 1993), they built on previous theory and research. They constructed a model based on Hackman's JDC model, Manz and Sims' (1992;1987) self-leadership theory on management behaviours in SMWTs, SMWT characteristics such as composition, beliefs and process and finally Lawler's job involvement theory (1992;1986). Outcome measures were again satisfaction, organisational commitment, perceived positive change, and effectiveness as rated by supervisors and employees. They found that each of the input variables did predict the outcome variables apart from Manz and Sims' leadership model. However, in 1997, Cohen, Chang and Ledford sought to validate and re-examine the leadership model and did find support for the hypothesis that self-management leadership predicts quality of work life and effectiveness.

Although these models offer valuable information about which aspects of job design should be considered when implementing successful teams as SMWTs they have a number of limitations. A common failure of the models described above is that they only investigate the direct effects between input and output variables and fail to investigate in any detail the precise mediating and moderating effects of process variables (Parker & Wall, 1998) and they lack a focus on employee well-being (Sonnentag, 1996).

2.2 History of Teamwork

The following section summarises how the STS approach was implemented in organisations across Europe and how, in later years, Japanese style teams became popular in the Western world.

2.2.1 The First Wave of Implementing STS Principles - STS in Scandinavia

The STS principles were mainly adopted in the Scandinavian countries, mainly in Norway (Gulowsen, 1971; Thorsrud & Emery, 1969) and Sweden (Gyllenhammar, 1977) in the early seventies. The main objective of Gulowsen's research was to determine the degree of autonomy in SMWTs (Ulich & Weber, 1996). He based his research on studies in eight organisations with SMWTs (Gulowsen, 1971). However, it is the experimentation of SMWTs within Swedish car manufacturers which has received the most attention (Guzzo, 1996). The Swedish car manufacturers, Volvo and Saab, took a lead in implementing self-managing work teams (Bernstein, 1988; van Houten, 1987). In the sixties and seventies, these organisations struggled to attract and maintain qualified workers as employment rates were low and education levels were rising, educating individuals to put forward high demands of challenging jobs, opportunities for learning and personal development. This, combined with an understanding that the development of large organisations led to individuals feeling lost, unimportant in the overall scheme with little or no control over their work, lead to labour unrest and wildcat strikes (Gyllenhammar, 1977). The dissatisfaction with the existing working conditions was also reflected in workers' absence and turnover rates and little interest in product quality. At Volvo, up to 50% of workers would be absent on Mondays and Fridays in 1970. As a result, Volvo and Saab re-organised many existing assembly line plants and built new plants such as Kalmar in the early seventies to meet the challenges of society. However, Sweden, along with other Scandinavian countries, has a strong tradition of employee involvement and collaboration between management and unions, which facilitated the change from a

bureaucratic, centrally managed organisation to a de-centralised organisation with self-managing work teams.

The strategy at Volvo reflected very much the theory of STS consisting of four "legs" (Bernstein, 1988; Gyllenhammar, 1977):

- Major investments in trucks, buses and industrial equipment to spread out the business from mainly focusing on cars and reduced the headquarters from 1800 to 100.
- Investments in making the physical surroundings cleaner and more pleasant to work in.
- Changes in the physical environment to reflect the fact that people were now working in groups of less than twenty people. The assembly line was replaced with movable platforms allowing SMWTs to work on a whole car together and moving the car on to the next SMWT. This minimised several of the negative effects of the assembly line: People were working in SMWTs and experiencing increased opportunities for personal contact and support, they could now talk together without having to shout over the assembly line; they could control the pace and instead of carrying out jobs of a duration of 30 to 60 seconds, small jobs could now be combined so that a job would take up to eight minutes to complete. SMWTs were responsible for executing quality control.
- Finally, emphasis was made on employees learning in their jobs, developing personally and being rewarded accordingly (pay for skills acquired).

SMWTs would typically be responsible for maintenance, quality control, hiring and firing (in collaboration with management), training, and budgeting with regards to materials and minor investments (van Houten, 1987).

However, job rotation and SMWTs were not implemented organisation-wide as there was an understanding that not all employees were interested in the

benefits of teamwork and not all types of work were easily organised on the basis of STS principles. Critics claim that SMWTs were only implemented in areas where employees complained about working conditions (van Houten, 1987).

2.2.2 Self-Managing Work Teams in other Countries

The Saab plants were visited by American autoworkers and met with much criticism. Although this can hardly be said to constitute a scientific evaluation of the possibilities of transferring SMWTs across the continent, it still gives us some indication of how SMWTs may be perceived (Cotton, 1993). It was felt that the idea of SMWTs was not easily transferable to the United States (US) as they, contrary to Sweden, did not have a tradition of employee involvement, participative management and union co-operation. The US workers saw SMWTs as exploitation rather than as an opportunity. Further, as the Swedish market economy changed, so did the work organisation and in the 80s many of the SMWTs died out as the economy deteriorated (van Houten, 1987).

In the US, the inspiration to establish teamwork has mainly come from Japan (Van Houten, 1987). However, in recent years, SMWTs have become increasingly popular in the US (Cohen, Chang & Ledford, 1997).

2.2.3 Teamwork in Europe

Since the beginning of the 1990s, Japanese style teams began to spread to Europe and the States. This trend has been especially prevalent within car manufacturing (Ulich & Weber, 1996). Womack, Jones and Roos' (1990) famous book 'The Machine that Changed the World' opened the eyes of the Western world to the Japanese "miracle". For example, they found that it took Japanese car manufacturers only half the time to assemble a car in comparison to Western car manufacturers. Further, storage times in the Western world were longer and quality represented more often a problem. Also, designing the car and putting the new product on the market took much longer in the Western world than in Japan. They concluded that these changes were due to

the fact that twice as many workers were working in teams in Japan as in the Western world. Although Womack et al. (1990) offer little empirical evidence that these result are due to teamwork, teams have become widely popular over the last twenty years (Ulich & Weber, 1996).

In their purest form, Japanese style teams are about "lean production" – the standardisation of work processes with the explicit aim of a perfectly balanced system where all processes are streamlined to such a degree that there are minimal errors. This type of teamwork is especially favourable within manufacturing where processes can be standardised into the smallest detail (Mikkelsen, 2000). This type of team has been compared to Tayloristic work design due to its low levels of autonomy. In Europe, however, few teams are pure lean teams. Most teams lie somewhere on the continuum from SMWTs to lean teams (Mikkelsen, 2000).

2.3 Prevalence of Teamwork

For years, teamwork in organisations received relatively little attention but interest increased dramatically in the 80s and 90s (Cohen et al., 1997; Guzzo, 1996). Although teamwork has been around for decades, it is not only recently that it has found its way into organisational design as a permanent feature of the workplace (Parker & Williams, 2001).

In 1992, Gordon estimated that 80% of US organisations with 100 or more employees applied teamwork in some way. Lawler, Mohrman & Ledford (1992) found that 47% of Fortune 1000 companies in the US reported having self-managing work teams and Osterman found in a survey in 1994 that 54% of leading US companies had self-managing work teams. The number is thought to be on the increase (Cordery, 1996). In 1999 Devine, Clayton, Phillips, Dunford and Melner (1999) conducted a survey of 405 US companies from different sectors. They found that 48% used some kind of teamwork. Breaking this number down by type of organisation, they found that 81% of non-profit organisations used teams compared to 50% in blue-collar organisations and 35% in white-collar organisations. Overall, they found that

organisations that used teams were more successful, and were larger both in terms of number of employees and also in number of departments and sites.

In the UK, 55% of manufacturing companies reported using teamwork in some form (Waterson, Clegg, Bolden, Pepper, Warr & Wall (1997) in Parker & Williams, 2001). Based on the WERS (Workplace Employee Relations Survey) data Cully, Woodland, O'Reilly and Dix (1999) questioned whether organisations in fact had introduced teamwork or only stated so in order to follow the current trend. They found that although 65% of employers reported that the majority of employees were working in teams, only 62% reported that the so-called team members actually worked together! Further, only 54% of employers reported that employees in the largest occupational group worked together and were jointly responsible for a product or service. This lends support to the belief that teamwork may be a "buzzword" in today's organisations, with less attention paid to the actual nature of teamwork. Many organisations claim to have teamwork even if the way work is designed does not fit the definition of teamwork as the label "team" is considered to be motivating and energising (Katzenbach & Smith, 1993).

Further, Cully et al. (1999) found that teamwork where employees decided collectively how work is done in addition to the above criteria were prevalent in 35% of the organisations participating in the study. Only three percent of organisations reported having teamwork where team members would themselves appoint their team leaders.

According to Guzzo (1996) two factors have played an important part in the development of teamwork. First, a number of studies were published where SMWTs had been introduced in Swedish industry; some of the most famous being carried out during Volvo's implementation of SMWTs as a replacement for the traditional assembly line described above (Gyllenhammar, 1977). Second, international competition grew fierce especially with increased pressure from Japanese products becoming increasingly popular in the European and American markets. The success of Japanese firms was found to be brought about by ways of organising work not widely spread in European

and American companies. Groups in different variations e.g. quality circles were responsible for detecting and correcting errors and creating innovative ways of designing work (Guzzo, 1996). Also Goodman, Devadas and Hughson (1990) have suggested why teamwork may become increasingly popular in the future. First, there is a continuously growing interest in participatory work processes; second, there is a widespread experience of other, less complex, types of teamwork such as quality circles and finally, new technology is bringing about interdependent ways of working.

2.4 Employee Health and Well-Being in Teamwork

There are differential views on how teamwork may influence employee health and well-being (Parker & Williams, 2001).

The Human Resource Management (HRM) and occupational health psychology (OHP) research establishments have traditionally perceived teamwork differently (Sonnentag, 1996). The majority of HRM research has focused on the *organisational benefits* of teams and SMWTs in terms of productivity and quality and on *individual effects* in terms of organisational commitment and job satisfaction (Yeatts & Hyten, 1998). This body of literature tends to favour teams because of the apparent benefits derived from increased use of employee skills, particularly those related to creativity and innovation (Moorhead, Neck & West, 1998). Another apparent benefit is more efficient flow in that team members can help each other out and take over other team members' tasks ensuring fewer unwanted breaks.

In contrast, OHP research has primarily investigated the *negative effects* of teams in terms of both psychological and physiological stress (Melin, Lundberg, Soderlund & Granqvist, 1999; Trist, Susman & Brown, 1977). Working in teams has been associated with a higher incidence of stress (Cox, Griffiths & Rial-González, 2000; Parker & Wall, 1998; Parker & Whybrow, 1998).

However, there is evidence to suggest that *correctly implemented* teams not only enhance commitment and job satisfaction, but also decrease stress and improves organisational health (Sprigg, Jackson & Parker, 2000; Nielsen, 2000), and that there are differences among different types of teams as to whether they have a positive or negative impact on employee health and well-being (Parker & Williams, 2001). Further, increased opportunities for skill use have been found to be positively related to job satisfaction (Nicholson & West, 1988) and in "learning organisations", where employees are encouraged to learn from mistakes and develop new ways of responding to challenges, they reacted positively to their work (Simpson, 2000). Especially, teams may bring about improved employee health and well-being based on the fact that such teams provide rich opportunities for high levels of control in the workplace in addition to social support (Stansfield, Head & Marmot, 2000; Schnall, Landsbergis & Baker, 1994; Karasek & Theorell, 1990).

The following section outlines the research on teamwork and employee well-being.

In order to identify research on employee health and well-being in teams, extensive literature searches were conducted on PsychInfo, EMBASE, IBSS, ISI using search terms such as team, teamwork, self-managing work teams, self-directed teams, autonomous teams, semi-autonomous teams, self-regulating teams, self-managed teams and health, well-being and stress.

The results of the literature search were subsequently narrowed down, based on the following criteria: the type of team in question, the focus of the study and whether research had been conducted in the laboratory or not. These criteria are described in detail below.

Type of team

As described in the introduction, there is a wide range of types of teamwork. However, only Japanese style teams and SMWTs are considered in this literature review, as these are the types of teamwork under study. In the

review, it is clearly stated which type of teamwork is being investigated as this may have an impact on how employees respond to teamwork.

Focus of the study

Studies were selected on the basis of whether they had a clear employee well-being focus and considered working conditions as experienced by employees. Therefore studies focusing on performance and productivity were not included. Although many of these often include a measure of either job satisfaction or commitment, it was decided that including these studies did not offer any added value, as these "secondary" measures often do not receive much attention, neither do these studies offer careful consideration of how the working conditions may be perceived by workers but rather on how work design factors impact on performance.

Real-life research

Experimental studies of teamwork are not reported in this thesis because they do not reflect real-life teamwork in organisations for the following reasons:

- Most experimental studies employ students with limited knowledge of working life (Ulich & Weber, 1996; Cotton 1993).
- The tasks applied in experiments are often time-limited and thus do not allow for a team identity to develop (Ulich & Weber, 1996).
- Research conducted in an experiment does not reflect a real life situation where team members depend on each other to carry out the task, and if they do not achieve the objectives of the team it may have wide-ranging consequences, i.e. participants may be dismissed and become unemployed (Ulich & Weber, 1996).
- The tasks applied are often limited in scope in terms of simple, mechanical tasks, role play or simple decision making processes and tell us little about the dynamics of real-life teams whose decisions have serious consequences for e.g. quality, costs and safety. The consequences are not easily imitated in the laboratory (Cohen & Bailey, 1997; Cotton, 1993; Nemeth & Kwan, 1987).

- It is in the nature of experiments that all contextual factors are erased to allow for full control of variables. However, this is impossible in real life situations and rather than trying to erase these, they should be accounted for in research in order to obtain a detailed understanding of teamwork (Cohen & Bailey, 1997).

2.4.1 Early Intervention Studies

This section outlines early research on employee well-being in SMWTs and offers an evaluation of these studies.

SMWTs in a US coalmine

One of the first studies to investigate employee well-being in teams was conducted by Trist, Susman and Brown in 1977. Based on the socio-technical principles derived from the study in 1951 (Trist & Bramforth, 1951) they introduced SMWTs in an American mine. Twenty-four miners volunteered to participate in the project and were divided into three teams. They received six weeks of training to learn how to conduct their new tasks and the work was designed after socio-technical principles to create a match between the social and technical aspects of work. The outcomes of the SMWTs were compared to two other sections in the mine in which work was traditionally designed. Effects of the SMWTs were found to be increased productivity, fewer accidents and lower turnover. However, the authors emphasised that improved equipment, more members of a section in the autonomous section and the fact that miners in the SMWTs overtly competed against the other sections may have influenced these effects. The miners themselves reported that they experienced more autonomy regarding the division of labour and work procedures and they felt highly dependent on each other and valued such interdependence. They also experienced improved relations to management. Although the study included comparison groups, it has several limitations:

- The only variables under study were autonomy and interdependence. It is predictable that these would change, as these were the variables

being manipulated. Although the effects of the contextual changes were discussed, these were not thoroughly investigated.

- The changes in working conditions were only sporadically explored by informal chats to team members and not included the main data collection methods, i.e. the survey and therefore no relationships were established between employee well-being and working conditions.
- Only a very small group of miners were engaged in SMWTs. This makes it difficult to make any generalisation to other teams and to conduct any sophisticated statistical analysis.
- Although a control group was applied in this study, it has to be questioned how reliable it is to use control groups in real-life research. Changes and spill-over effects are likely to take place in the control group, which may contaminate the findings.
- Analyses were carried out at the individual level without consideration of whether this was the appropriate level of analysis.

SMWTs in Swedish bus ticketing manufacturing

Gardell and Svensson (1981, op. cit. Karasek & Theorell, 1990) investigated self-managing work teams in a Swedish manufacturing firm making bus ticketing machines. Employees were divided into teams of five to fifteen members. Only part of the organisation was redesigned into SMWTs thus enabling the researchers to compare it with the remainder of the organisation. Data was collected in the form of a survey and qualitative interviews. The results of the survey indicated that only 7% of members of SMWTs reported stress in comparison to 18% of workers on the traditional assembly line. Only 2% of team members reported negative spill-over effects. For workers on the assembly line, 22% reported such problems. However, negative effects were also reported; 16% of employees working in SMWTs reported having too much to do in comparison to only 10% of the comparison group. Interviews were conducted to supplement the quantitative data and it was found that team members reported increased worker confidence and self-esteem.

The study carries several limitations:

- Only outcome measures were included in the reports of the survey. This leaves the reader with little opportunity to gain any knowledge of how working conditions changed and/or differed from the working conditions in the comparison group. Only a measure of workload was included in the study.
- This means that it is difficult to conclude that the effects found were due to the SMWT design. These findings may be due to other factors outside the researchers' control.
- The same problems prevail by using a control group situated on the same site; there may be spill-over or contamination effects as described above.
- Analyses were carried out at the individual level.

SMWTs in British confectionery

Wall and Clegg (1981) conducted a longitudinal action research project in a confectionary company. They investigated the effects of SMWTs on employee well-being over a period of 33 months. Participants in the study were 35 blue-collar workers. Surveys were conducted in three waves: before the implementation of SMWTs, during the change period and after SMWTs had run for a minimum of six months. Measures used were the JDS (Hackman & Oldham, 1975), the GHQ (Goldberg, 1978; 1972) and departmental and company records measuring performance and turnover. The surveys were supplemented by observations and interviews during the initial phases of the project. SMWTs were implemented by changing the production process so that teams could follow the process of making sweets from raw materials to packed sweets. SMWTs were given autonomy over the pace of production, distribution of tasks between members and time planning. Further, production targets were agreed with teams. The original structure with one manager, two supervisors and an assistant was changed to one manager and one clerical assistant. Finally, SMWTs received immediate feedback on performance. The results of the survey indicated that team members did report increases in team identity and autonomy. However, the feedback structure seemed not to be effectively implemented as no changes were found in feedback over time.

Employees also reported increased internal work motivation, general job satisfaction, mental health, performance and lower turnover. Further, interviews indicated that employees were not interested in returning to the previous work design and reported being less stressed and more relaxed in their jobs. However, problems were experienced in terms of conflicts with other areas of the factory and managers felt threatened by SMWTs.

Several weaknesses can be identified in the study design, despite the fact that it was longitudinal and participatory:

- The lack of control groups makes it difficult to conclude whether changes took place only in the groups studied.
- It is not possible to know whether the nature of an action research project meant that effects were in fact influenced by the "Hawthorne effect". However, as the study was longitudinal and researcher input decreased during the last months of the projects, such an effect did not provide a threat to the validity of the study.
- As with the previous studies, other factors were not investigated. For example, the authors mention in their discussion that some team members experienced pay increases and improvements in target setting and feedback systems; there may be other internal as well as external factors which may have contributed to the findings in this study.
- The only analyses carried out concerned comparisons across time between variables, no analyses were conducted to establish any relationships between input and output variables.
- As with the previous studies, analyses were carried out at the individual level.

SMWTs in British confectionery II

Wall, Kemp, Jackson and Clegg (1986) carried out a quasi-experimental study in a British confectionary company investigating the effects of SMWTs on work motivation, job satisfaction, organisational commitment, mental health,

performance and turnover. They compared four different groups of employees working in production; two in a brownfield site with traditional work design and two in a greenfield site where the day shift was designed into SMWTs from the outset and the evening shift was redesigned into SMWTs after 12 months. Surveys were carried out three times: after 6, 18 and 30 months. The findings of the study indicated that SMWTs improved intrinsic job satisfaction, but had little or no effect on job motivation, organisational commitment, mental health, work performance and turnover -- in fact turnover increased in the SMWTs on the greenfield site. Qualitative accounts reported that employees enjoyed the autonomy and the lack of supervision by management. Based on these findings Wall et al. concluded that SMWTs have specific rather than wide-ranging effects on how employees respond to SMWTs.

However, despite the strength of the study being quasi-experimental, it had several limitations:

- Again, there was little consideration of the relationship between input and output.
- It failed to explain why SMWTs only seemed to influence job satisfaction. Only the above mentioned outcome measures and the nature of work teams were measured in the survey. It may be that there were other factors that accounted for the findings rather than SMWTs per se. Possible explanations may be: First, employees were selected from the brownfield site to work in the new factory. However, the factory was built 250 miles away. 83 percent of the participants in the study were women and the average age was 31 years. A possible explanation for the higher turnover at the greenfield site with SMWTs may be that not only the long distance workers had to move but that the vast majority were women, many of these younger women who may have family responsibilities with younger children. Moving a long distance is likely to have had an impact on the opportunities for support outside work and may have led some to

move back to their social networks. Another possible explanation offered by Wall et al. is that employment rates were higher in the area of the greenfield site. Second, at the greenfield site, management were not trained thoroughly in the their new job role and reported high levels of stress. Further, turnover was high: four different day shift managers were employed over the first three years. It was also reported that some managers were sceptical about SMWTs from the outset. It is likely that a management team that experienced problems and where managers were unable to support and communicate effectively with teams, influenced how employees responded to their working conditions in terms of organisational commitment. Third, team workers would receive immediate feedback regarding team performance and as they did not perform as well as expected: this may have had a demotivating effect. Fourth, in addition, employees at the greenfield site grew from 42 on the day shift to 84 and from 25 to 60 on the evening shift. A large increase of this size in the workforce over just three years is likely to have effects on the communication flow and ways of co-operating across teams.

- As the workers for the greenfield site were recruited from the brownfield site, it is very likely that there have been changes at the original site which influenced working conditions here; these were not considered.
- As with the previous studies, analyses were carried out at the individual level.

Summary

Common for all the findings in this section, is that studies of employee well-being overall indicated that employees benefit from working in SMWTs. However, overall, several issues can be raised in relation to these studies:

- First, only SMWTs were studied. As described in the introduction, Japanese style teams were not yet popular in the UK and US.

- Second, it is very difficult to paint any detailed pictures of how teamwork influence is related to employee well-being as there is no in-depth investigation of the changes in the organisational context.
- Third, where working conditions were investigated, these tended to be those only predicted to change, i.e. autonomy and the degree of teamwork.
- Fourth, it is problematic to include 'control groups' in the same way as in experimental studies. Also organisational control groups exist in a context, which should be considered carefully.
- Finally, where working conditions were examined these were not statistically related to measures of employee well-being.

2.4.2 Recent Work Redesign Studies

This section describes recent intervention studies on employee well-being in teamwork.

SMWTs in Dutch can manufacturing

Terra (1995) evaluated the implementation of SMWTs in a Dutch metal cans manufacturer. SMWTs were introduced in an entire plant with 430 employees. Previously, the work had been entirely Tayloristic but, following detailed job analysis, work was redesigned into SMWTs. The production facilities were altered to accommodate the demands of teamwork and so were the planning and management processes. The changes were evaluated and the results were compared to other company sites and measures taken before the implementation. Employees earned on average more and sickness absence decreased by 50%. Flexibility improved resulting in the creation of "niche" production. Productivity increased by 66%. Workers were described as better qualified, informed and motivated.

However, the case study does not tell us about how results were measured so it is difficult to evaluate the study on the basis of the information given. Other limitations also have to be considered: the investigation of working conditions;

the relationship between input and output and the issue of control groups; and the level of analysis was again at the individual level.

SMWTs in Danish bus drivers

Netterstrøm (1999) reported a study where work had been redesigned for a group of bus drivers on the same bus line. Using participatory methods, a group of bus drivers took part in a series of workshops identifying poor working conditions for bus drivers. Based on the results, SMWTs were piloted on one bus line where drivers would be responsible for budgeting, planning and running the service, planning of the rota and the physical environment in the buses including changing the seats of drivers but also introducing coffee vending machines for passengers. In all, 29 drivers participated. Overall, the financial targets were met, sickness absence decreased and the number of customer complaints decreased.

Three methods of evaluation were applied:

- A questionnaire was distributed to all drivers in the pilot project during the first year every three months; in all, four times. Results indicated that satisfaction with both the project and the job decreased over the first year. However, drivers reported being increasingly more satisfied with the level of influence they experienced. Interestingly, those drivers who had participated in the workshops reported higher levels of satisfaction than the other drivers.
- Nine months after the implementation of SMWTs, a questionnaire was distributed to a large number of drivers in the company, including the SMWT drivers. Results indicated that the drivers in the study reported being less stressed when it came to work content, workload and control, leadership climate and physical work environment. In addition, they reported having a better psychosocial work environment overall, and better interpersonal relations horizontally and vertically than other drivers.
- Finally, interviews were conducted with six drivers every time the SMWT questionnaire was distributed. Drivers reported that they felt

they had a higher degree of responsibility than prior to the SMWTs on several levels; responsibility regarding the finances, absence decreased due to drivers feeling responsible for colleagues who would have to step in your place if you were absent, higher degree of responsibility towards equipment which led to less service being required in the daily service of the buses. Planning and scheduling the work enabled drivers to have longer breaks and taking breaks at the same time so that the opportunities for social contact increased. However, the most important change was reported to be the degree of participation in running the bus line.

This study included more detailed information on how employees' working conditions changed overall after the implementation of SMWTs. However, the group under study was relatively small which limits the opportunities for vigorous statistical analyses including establishing the relationships between input and output variables.

Summary

As with the early studies, the results of these studies indicated that employees benefit from working in SMWTs. Study design has improved in terms of more detailed analyses and triangulation. However, the same issues regarding the lack of focus on the relationship between working conditions and employee well-being prevail. It is not possible to conclude that the effects found on employee well-being stem from working in SMWTs or other factors outside the control and investigation of the researchers.

2.5.6 Comparative Studies

In recent years, there has been an increasing interest in comparing teamwork against other types of job design as in the 80s. However, there has also been an interest in comparing different types of teamwork. This section offers a critical evaluation of recent studies using a cross-sectional design to clarify aspects of employee well-being in teamwork.

Teamwork in the Netherlands

Steijn (2000) carried out a survey in the Netherlands with 835 workers from different sectors through the so-called Stichting Telepanel where a representative sample of the working population is given a free home computer in return for filling in a questionnaire once a week. Steijn investigated working conditions and employee well-being using measures of work stress and job satisfaction in four different types of job design:

- *Tayloristic-type jobs* characterised by employees possessing little or no autonomy and not members of a team.
- *Professional/craftsman jobs* characterised by a high degree of autonomy but not working in teams.
- *"Normal" teams* where employees worked in teams but had little or no autonomy.
- *Autonomous teams* where team members had a high degree of autonomy.

Steijn found that both types of teams were associated with increased autonomy, skills use and learning. No differences were found with regards to work stress between work systems but members of both types of teams were significantly more satisfied with and committed to their jobs than employees working in tayloristic work systems. No significant differences were found between the two types of team.

However, the study had its limitations:

- A serious problem with this study was the operationalisation of types of work design. Participants were divided into the four types of job design using six categories of autonomy. For each question there were three answer possibilities: Decision taken by self, by supervisor or by others. Participants were divided into types of work design so that if a respondent had used the first answer category in three or more cases he/she was classed as engaging in tayloristic-type work. If respondents answered in the affirmative to making decisions

themselves to three or more questions, they were considered professionals/craftsman. Respondents were grouped into the team category if they responded that the team made the decision in three or four cases of the examples or into the SMWTs category if they responded that the team made the decision in five or six of the examples given. However, Steijn failed to measure the teamwork aspect rather than just autonomy. Thus it may very well be that some of the respondents worked in teams with a supervisor that made most of the decisions (and thus placed in the tayloristic category) or made the decisions themselves, as could be the case with highly educated individuals: the degree of interdependence was not measured. Ulich and Weber (1996, p. 265-267) have outlined a structure where this problem is addressed by using several response categories in order to decide the degree of autonomy allocated to teams. The response categories include: "The group alone", "The group together with people having other functions", "A particular group member alone", "A particular group member together with people having other functions", "The foreman or a person having other functions", and, finally, respondents are asked to specify the person who has other functions. Using this response matrix offers researchers the opportunity to identify, not only the degree of autonomy allocated to the teams but also the internal dynamics of teams. However, it does not include measures of the degree of interdependence. Cohen and Ledford (1994), Cohen, Ledford and Spreitzer (1996) and Cohen, Ledford and Chang (1997) solved the issue regarding whether employees are actually working in teams by including an item in their questionnaires asking respondents whether the way of working fit the team description provided.

- Steijn did not establish the relationship between input and outcome variables.
- Although additional measures of working conditions were included in the study such as opportunities for skills use as hypothesised by HRM

- no in-depth analyses of working conditions for the four types of work design were included.

- Analyses were carried out at the individual level, not at team level as participants would not be working together.

Teams in UK manufacturing

Parker and Williams (2001) reported a study investigating teams and employee well-being in a UK manufacturing company. They compared four different groups of workers: one maintenance and three production groups. Two surveys were conducted: one shortly after implementation in the maintenance team in which teams were piloted and subsequently in two of the production groups; in the last group (traditional work), teams were not implemented. A second survey was conducted after teams had been running for a longer period of time and been implemented in the remaining production group. The two production groups where teams were implemented initially differed in the way in which they had been implemented, in that in one team all workers had been involved in the implementation process (participative team) and in the other, only team leaders had been involved in the process (non-participative team). In the first survey, results indicated that the participative team and the maintenance team experienced more autonomy and functioned better than the non-participative and traditional teams. The conclusion was drawn that it is important to involve all workers in developing teams. A possible explanation for the success of the maintenance teams was that the job task was especially suitable for teamwork and that they had been organised in teams for a longer period of time.

Between the first and second survey, teams were continually developed in the maintenance teams whereas in the participative and non-participative teams, no further attention was paid to the team structure. The traditional work design group was redesigned into teamwork but received little further attention. Results of the second survey indicated that the maintenance team differed significantly from the three production groups in that they reported more enriched jobs, felt more optimistic about teamwork, experienced better team functioning and reported higher job satisfaction and less stress. Based on these

findings, it was concluded that it is important continually to support and develop team structure. In further support of this, it was found that the participative teams experienced lower well-being than the remaining two production groups. These results were taken as evidence suggesting that these team members were disillusioned by having had effective teams but ones that had not been sufficiently supported and developed (Parker & Williams, 2001). This study is difficult to evaluate as the authors provided little information regarding the nature of work in the teams and the study itself. Contrary to previous research, this study examined teamwork at the group level, but not the team level.

As with previous studies the relationship between input and output variables was not established.

Although the degree of support given to teams during and after implementation was explored, little attention was paid to other contextual factors.

Teamwork in UK manufacturing

Parker and Williams (2001) conducted another study investigating how employees respond to different kinds of teamwork in terms of traditional teams with employees working in teams led by a supervisor and SMWTs where team members have overtaken the roles and responsibilities of supervisors in a chemical processing plant in the UK. Officially, SMWTs had been implemented site-wide, however, some teams were seen by managers to be more successful than others and these differences were investigated. It was found that the more successful teams were self-managing whereas the less successful teams in reality functioned as traditional work teams. SMWT members reported higher degrees of autonomy, clearer roles and responsibilities and were more innovative. However, they also reported a higher workload than employees working in traditional teams. This was also reflected in employee well-being: Members in the SMWTs reported being more committed and satisfied with their jobs but, at the same time, they also experienced higher levels of stress. Three main barriers were identified for teams to become self-managing: a) management style, b) lack of face-to-face

communication between team members, c) lack of detailed feedback on performance and process.

A number of shortcomings were identified in this study:

- As with the previous study, little information was provided regarding the design, methods and procedures of the study, which makes it difficult to evaluate it.
- However, as with the previous studies little attention was paid to the relationship between working conditions and employee well-being.
- Although contextual factors were considered, it is not clear to which degree these were investigated in the survey or based on informal discussions. However, the focus was not only on the traditional teamwork measures: measures of roles and responsibilities and innovation were also included.
- Analyses were carried out at the group level, not the team level.

SMWTs in Swedish car manufacturing

A comparative study was conducted in 1999 by Melin, Lundberg, Söderlund and Granqvist examining the differences in stress levels in assembly line workers and SMWTs in Swedish car manufacturing. Fifty employees participated in the study of which 15 worked in SMWTs. SMWTs had been introduced 8 months prior to the study. The degree of control and workload was measured and stress levels were measured through self-reports, blood pressure and urinary catecholamines and cortisol. Melin et al. found that workers in SMWTs experienced increased opportunities for learning new skills, more varied jobs and higher levels of interdependence. With regards to self-reported stress levels, assembly line workers reported being more tired but less irritated that teamworkers. This was assumed to be due to the higher demands of working together in the teams. Physiological stress measures indicated that workers on the traditional assembly line experienced increased systolic blood pressure and heart rate whereas this was not the case for teamworkers. In addition, epinephrine and norepinephrine levels were significantly higher in the assembly line workers. Also, gender-specific

analyses were carried out but these are not reported here, as there were only 8 females and 7 males in the SMWTs.
Several limitations were identified in the study:

- Authors were aware that teams had only been running for eight months but felt that this was a sufficient period for employees to settle, eliminating any "Hawthorne effects". However, as discussed in the previous study by Parker and Williams (2001), effects may decrease over time depending on the amount of support teams receive rather than the "team nature".
- Again, little attention was paid to contextual factors, which may help explain the findings.
- Sample sizes were very small which again makes it difficult to use sophisticated statistical analyses.
- The relationship between working conditions and employee well-being was not established.
- The use of control groups has to be questioned for the above reasons.
- Analyses were carried out at the individual level.

2.4.4 Studies of Teamwork Dynamics

Exploring team processes, van Mierlo, Rutte, Seinen and Kompier reported in 2001 a study where effects of self-managing work teams on both positive and negative well-being were investigated in the Netherlands. The study included 138 employees working in SMWTs in a supermarket chain. The main aim of the study was to investigate whether the degree of team autonomy related to positive and negative well-being as measured by motivation to learn and psychological fatigue. In addition, they also investigated individual work characteristics and social relationships with colleagues as possible mediating factors. The results indicated that team autonomy is positively related to individual autonomy, task variety and social relationships with colleagues. A high degree of team autonomy was related to lower workload. Individual autonomy, task variety and workload were related to increased motivation to learn new things. A good relationship with colleagues was found to be related to less fatigue whereas the opposite was the case for high workload. It was

found that team autonomy -- where it was related to increased individual autonomy, task variety, good interpersonal relationships and decreased individual workload -- is positively related to employee well-being. This study presents a number of limitations:

- It does not account for differences in team autonomy – it is reasonable to expect that team autonomy differs within teams, as some individuals will experience more team autonomy than others. The study does not allow us to investigate whether high-autonomy teams experience higher well-being than low autonomy teams.
- The scale used for team autonomy was an adapted version of the individual autonomy measure where the word "you" had simply been replaced by the phrase "your team". It may be that where employees have reported little individual autonomy but a high degree of team autonomy, in reality one member of the team is acting as a supervisor. The scale used does not measure joint autonomy but merely the degree of autonomy within the team.
- In relation to the previous point, it is not measured to what degree, employees were working in SMWTs as such or whether it is merely a question of calling it a SMWT.
- The authors also claimed that social relationships mediated the relationship between team autonomy and the outcome variables, however, there was no significant relationship between team autonomy and fatigue. This begs the question, how can these mediate a relationship between variables when this relationship does not exist in the first place?

2.5 Conclusion

Figure 2.2 provides an overview of the research carried on teams. It includes information on the sample, the methods applied and the results in terms of changed working conditions and outcomes.

Figure 2.2: Overview of research on employee well-being and teamwork

Study	Organisation	Team type	Sample size	Methods	Working conditions	Outcome
Trist, Susman & Brown (1977)	Coalmine	SMWT	24	Cross-sectional Survey	Interdependence Management relations Autonomy	Accidents Productivity Competition between teams Turnover
Gardell & Svensson (1981)	Manufacturing	SMWT	?	Cross-sectional Survey Interviews	Workload	Confidence Self-esteem Stress Spill-over effect
Wall & Clegg (1981)	Manufacturing	SMWT	35	Longitudinal Survey	Team identity Autonomy	Intrinsic work motivation Job satisfaction Mental health Performance Turnover Stress
Wall et al. (1986)	Manufacturing	SMWT	67-146	Quasi-experimental Longitudinal Survey		Intrinsic job satisfaction Turnover
Terra (1995)	Manufacturing	SMWT	430	Longitudinal Survey Cross-sectional	Flexibility Communication	Absence Income Productivity Motivation Qualified workers
Netterstrøm (1999)	Service	SMWT	29	Longitudinal Cross-sectional Survey	Physical environment Responsibility Breaks	Financial targets met Job satisfaction Customer complaints

				Interviews	Participation		Absence Stress
Steijn (2000)	Various	Team SMWT	835	Cross-sectional Survey	Autonomy Skills use Learning		Job satisfaction Commitment
Parker & Williams (2001)	Manufacturing	Team		Survey	Autonomy Varied jobs		Optimism towards teamwork Team functioning Job satisfaction Stress
Parker & Williams (2001)	Manufacturing	Team SMWT		Cross-sectional Survey	Team	SMWT Autonomy Clear roles and responsibilities Innovation Workload	Commitment Job satisfaction
Melin et al (1999)	Manufacturing	SMWT	50 (15 in teams)	Cross-sectional Survey Physical measures	Learning Varied jobs Independence Demands		Irritation Stress
Van Mierlo et al. (2001)	Service	SMWT	138	Cross-sectional Survey	Team autonomy Fatigue		Individual autonomy Task variety Interpersonal relations Workload

Based on the literature, the following conclusions can be drawn:

1. In the 70s and 80s most research seemed to focus on SMWTs based on socio-technical principles whereas in the 90s and beyond, the focus spread to examine the effects of Japanese style teamwork.
2. It appears that carefully implemented and supported teams have positive effects on employee well-being.
3. SMWTs seem to carry more benefits for employee health and well-being that traditional work design and Japanese style teams.
4. The relationship between working conditions and employee well-being is seldom studied.
5. Triangulation only takes place in a few studies. Triangulation is important in order to make sure that the researcher achieves as complete and valid a picture as possible. One way of triangulating is to include both quantitative and qualitative measures and organisational data (Cox et al., 2000).
6. No control groups or very few control groups can be guaranteed to be controllable or fully matched to the group being manipulated. This is not to say that control groups should not be used, but previous studies have found that there are likely to be contamination effects (Nielsen, 2000) and changes within the control groups should also be considered. It therefore makes more sense to talk about comparison groups rather than control groups.
7. One way to reconcile the conflicting approaches of HRM and OHP is by adopting a model in which there is no single dimension of well-being/satisfaction, but where employees may concurrently experience job satisfaction and be committed to their job while suffering from stress (Cox, Griffiths, Rial-González & Thomson, 2000).
8. Most research that has been conducted is cross-sectional and therefore it is impossible to ascertain any causal effects. Also the lack of investigation of contextual factors makes it difficult to explore any extraneous variables that might account for the relationships established in existing research.
9. Contextual factors are seldom investigated. In 1990, Hackman called for more research investigating the contextual factors of team effectiveness and more detailed descriptions of the organisations under study to develop a

holistic understanding of how teamwork and its context influence team effectiveness. Cordery (1996) calls for the need to examine contingency factors such as management and their impact on employee well-being and quality of work life outcomes including the possible mediating and moderating effects of aspects of teamwork.

10. The same can be said for the research investigating employee well-being in teams: there is little research that investigates the unidentified factors that inhibit or promote employee well-being in teams. This is in line with Sparks and Cooper (1999, p. 220) who emphasise the need for occupational health psychology to develop models which encompass a larger range of variables in order to provide a clearer picture of the relationships between stress and working conditions. Ultimately this should provide a framework for more effective stress management interventions.
11. There is little research investigating the long-term effects on employee well-being. Hawthorne effects may occur.
12. Few of these studies report any negative findings. Organisations tend only to be interested in publishing success stories and even in studies that have been published it is likely that negative findings have been omitted, which would offer valuable insights regarding which pitfalls to avoid when implementing teams and SMWTs (Ulich & Weber, 1996; Cotton, 1993).
13. Teamwork is not appropriate for every task and function in an organisation (West, 1996); it should be carefully considered whether work can be designed and managed in a way which ensures true teams or SMWTs.
14. As mentioned above, the dynamics of how teams influence employee well-being is seldom investigated. Sonnentag (1996) calls for more studies at the team level. However, she also recognises the importance of investigating well-being at the individual level. In line with Lazarus' (1966) cognitive appraisal, dynamics should be investigated at the individual level because, for example, a group aggregate does not allow us to calculate whether an individual will perceive a good climate as moderating the relationship between poor working conditions and well-being.
15. The differential effects of these studies may be explained by the fact that studying teams in organisations is complex as it is difficult to isolate

variables of teamwork from other aspects of work (Yeatts & Hyten, 1998). Thus when studying teamwork it may be more sensible to conduct case studies in order to get a complete picture of how teams work in an organisational context. A case study is not a methodological choice; it is a choice of the object under study. A case study involves both the process of learning about the case and knowledge about organisations in general.

16. Conclusions drawn from the research reflect reactions within individuals rather than between-group differences. It does not address the impact of teamwork on individual reactions but rather taps individual perceptual interpretations of this impact (Mossholder & Bedeian, 1983).
17. Most research on teamwork has been conducted in manufacturing (Thompson & Wallace, 1997; Cotton, 1993). This poses the question whether the same effects can be found in white-collar jobs such as engineering where engineers traditionally have a high degree of autonomy but common prejudice may predict that they are socially unskilled and thus not teamworkers! Campion, Papper and Medsker (1996) conducted a study (see section 2.1.4 for a more detailed description of the study) with professionals and suggested a number of factors which should be considered when examining teamwork in professional jobs rather than manual work. First, professional jobs are more complex and thus already possess some of the characteristics that teamwork may offer workers, such as autonomy, task variety and opportunities for interaction. Second, it must be assumed that opportunities for training will be more widely available and that communication across teams already takes place. In terms of output variables, it is assumed that employees have greater opportunities for having a fulfilling and satisfying job and that it is more difficult to measure levels of productivity when it is no longer a distinguishable product but for example a service. Campion et al. (1996) also pointed out that employees may be members of temporary teams or even members of several teams at any one point in time.

As has become clear from the literature review, current theory and research have several limitations. It is necessary to work towards developing a detailed

understanding of teamwork. Whilst this type of work design is likely to benefit workers, more research is required to find out exactly how employees react to working in teams, be it a Japanese style team or a self-managing work team. All these aspects cannot be covered in this thesis; only the following will be addressed here:

- An investigation of teamwork in professionals.
- An in-depth analysis of the working conditions in teams and SMWTs.
- An investigation of the dynamics of teamwork. For example, how does team interdependence as the core characteristic of teamwork influence the relationship between poor working conditions and well-being? Sonnentag (1996) found in her literature review of employee well-being in teams and SMWTs that teamwork processes can act as moderators and mediators between working conditions and employee well-being and emphasised the importance of considering teamwork processes in combination with working conditions when analysing their effects on employee well-being.
- Consideration of how teamwork may be related to different measures of employee well-being.
- Consideration of whether team level or individual level analysis may be appropriate.
- An investigation of how specific aspects of teamwork may act as a buffer on the relationship between poor working conditions and employee well-being.
- And finally, investigating how opportunities for learning and innovation as a central feature of working in SMWTs are related to employee well-being and how contextual factors as exemplified by management may play a role in this relationship.

Following on from the literature, the main research questions in this thesis are:

1. What are the working conditions associated with poor well-being in teamwork situations?

2. Does working in teams buffer the negative impact of poor working conditions on well-being?

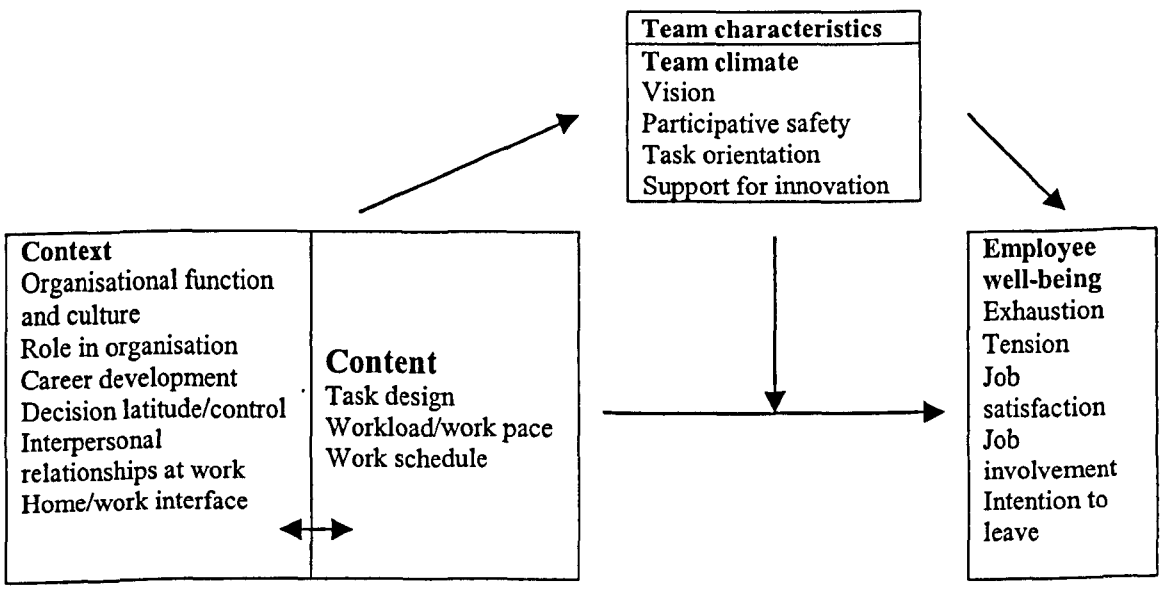
3. Which team process characteristics may act as a particularly strong buffer on well-being?

4. What role does opportunities for learning and innovation play in relation to employee responses to working in self-managing work teams?

5. What role does management play in the context of learning and innovation and how do employees respond to these?

In order to answer these questions, the following working model has been adopted:

Figure 2.3: Working model of employee well-being in teams



Based on this model, the following hypotheses are suggested:

Hypothesis 1: Due to the specific nature of teamwork, certain working conditions will be associated with poor well-being in this study.

Hypothesis 2: Employees working in teams with a high degree of team interdependence may experience higher well-being than those working in teams with a lower degree of team interdependence.

Hypothesis 3a: Team climate – as a measure of team process – will moderate the impact of working conditions on employee well-being.

Hypothesis 3b: Some aspects of team climate will have a stronger buffering effect than others. Participative safety, resembling informational social support will have a particularly strong effect.

Hypothesis 4a: Working in SMWTs will be positively related to opportunities for learning and innovation and job satisfaction and involvement.

Hypothesis 4b: Opportunities for learning and innovation will be positively related to job involvement and job satisfaction.

Hypothesis 5: A management that has a positive attitude towards and actively supports learning and innovation mediates the relationship between opportunities for learning and innovation and employee responses.

3. Background to the Two Case Studies

This chapter outlines the methods applied in the thesis and provides a description of the two case study organisations under study. It briefly outlines the risk management framework, which was followed in the data collection process and the underlying participatory principles of the framework. It then describes the two organisations with a detailed account of the type of teamwork present in each organisation and a discussion of how these teams differ a) from other types of teams and b) from each other.

3.1 Data Collection: The Risk Management Framework

The research presented in this thesis is based on the risk management strategy developed and tested at the Institute of Work, Health and Organisations (Cox, Griffiths, Barlow, Randall, Thomson & Rial-González, 2000; Cox & Rial-González, 2000; Rial-González, 2000). This strategy is described below. It is completed in seven stages that together describe a problem solving approach. It follows the recommendations at EU and UK level and provides a detailed understanding of the working environment and culture in the organisations examined (Cox et al., 2000). The stages are described below. In this thesis, only the data collected during the stages 1, 2 and 4 are used. The risk assessment cycle is outlined in figure 3.1.

- *Scoping and familiarisation*: Mutual familiarisation takes place at this first stage. The organisation is introduced to the risk management strategy and the research team develops an initial understanding of the organisation. Scoping refers to the process of identifying groups at risk by reviewing existing information.

- *Work Systems Analysis*: After identifying likely "at risk" groups (selected during the "scooping" process) and ensuring buy-in of the main stakeholders, the initial collection of information occurs: the work systems analysis. This analysis is based on semi-structured

interviews with a structured sample of the assessment group (see section 3.1.2).

- *Audit of Management Systems and Employee Support:* In parallel with the early stages of the risk management process, an Audit of Management Systems and Employee Support (AMSES) is carried out. It is designed to identify systems, facilities, and arrangements already in place for controlling problems related to stress at work, and for helping and supporting employees who experience such stress.

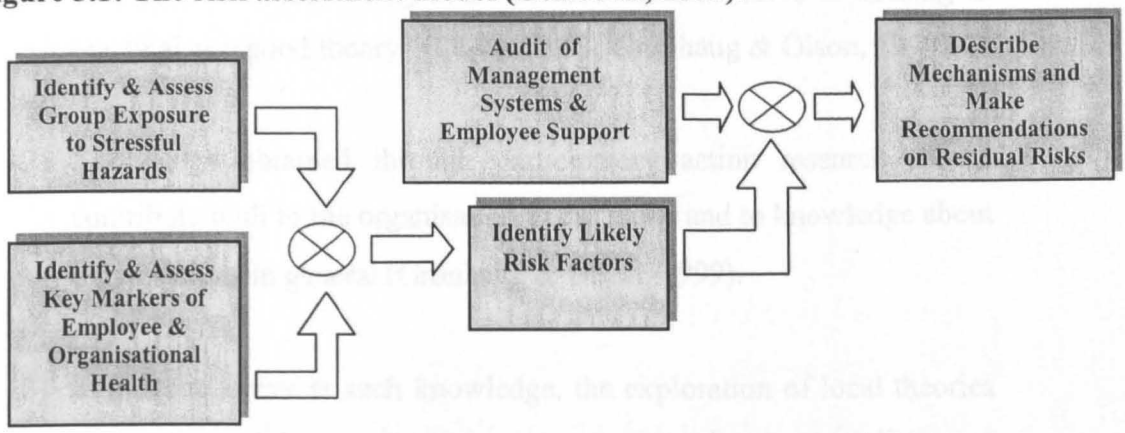
- *Risk Assessment Survey:* Based on the information gained in previous stages, a risk assessment questionnaire is designed to survey all members of the assessment group. The risk assessment survey is designed to quantify the major stressors associated with work, along with the positive aspects of work, and to establish possible links among these and employee well-being.

- *Feedback and Action Planning:* Once the results of the risk assessment survey have been analysed, they are fed back to the organisation. The results and the underlying pathologies inform the action planning.

- *Implementation:* At this stage, the implementation of the planned interventions takes place. This represents risk reduction.

- *Evaluation:* At this last stage of the strategy, an evaluation of the process and effects of the risk reduction is conducted to examine its impact on the likely risk factors and to extract relevant learning points.

Figure 3.1: The risk assessment model (Cox et al., 2000).



3.1.1 Participatory Action Research

The risk management approach is based on participatory principles with a strong emphasis on employee involvement throughout all stages of the process. It is thought that conducting research in organisational settings without actively involving employees often results in little understanding of the micro-environment or local context and can lead to inappropriate interventions (Cornwall & Jewkes, 1995). By way of a solution, encouraging employee involvement at various stages of the research process has become increasingly popular in recent years. Miller and Monge (1986) report that employee involvement enhances the flow and use of information as well as satisfying employees' needs to be heard and feel valued, and is thus effective both at cognitive and affective levels. Such involvement has been described as "a participative process to use the entire capacity of workers, designed to encourage employee commitment to organisational success" (Cotton, 1993). Several terms - action research, co-operative inquiry, action inquiry, participation and participatory action research - have been used to indicate various degrees of participation of a study (Grønhaug & Olson, 1999). In this thesis the term "participatory action research" is used to reflect the active involvement of employees at all stages of the research process.

The main principles of participatory action research are as follows:

1) Scientific knowledge is applied to investigate real life issues and to plan and implement interventions to improve the social environment.

This is well illustrated by Kurt Lewin's dictum "there is nothing as practical as a good theory" (Lewin, 1951; Grønhaug & Olson, 1999).

2) Knowledge obtained through participatory action research should contribute both to the organisation under study and to knowledge about organisations in general (Grønhaug & Olson, 1999).

3) In order to arrive at such knowledge, the exploration of local theories and participants' expertise is necessary so as to develop a realistic and detailed understanding of the organisation under study (Cornwall & Jewkes, 1995).

4) Only through the active involvement and participation of employees is it possible to obtain such a detailed understanding (Grønhaug & Olson, 1999).

The main vehicle for ensuring active participation during the risk management process is through the establishment of Steering Groups. Through them, the research team is offered the opportunity for triangulation, in that they feed back and discuss their findings with the Steering Groups and together they agree on the next steps and the best strategy for applying the risk management framework in the organisation. Establishing a Steering Group offers the opportunity to bring together stakeholders by identifying and creating networks between employees, managers, union representatives, occupational health and personnel departments, and by facilitating open communication between these groups of representatives from different areas and levels within the organisation (Zell, 2001; Gustavsen, 1998; Emery & Oeser, 1958). In case study A, three Steering Groups were established, a Steering Group representing key stakeholders from the support services, a management Steering Group consisting of the two departmental managers and finally a group of supervisors and employees. In case study B, a Steering Group consisting of stakeholders from the support services was established. This group would also be running the overall risk management project. Because of

the self-managing work team nature, risk assessments would be carried out at the team level, where each individual SMWT would act as a temporary Steering Group for each risk assessment.

3.2 Data Collection

As can be seen above, both quantitative and qualitative methods were used in the context of a risk management framework conducted for psychosocial and organisational hazards on work stress. It has been argued that coworker relations have primarily been considered in qualitative research whereas quantitative research has focused on job satisfaction and structural characteristics of the workplace (Hodson, 1997). Data were collected using interviews which informed the development of a context-specific questionnaire reflecting the working conditions of the organisation in question (full details of the design process can be found in Cox et al., 2000; Cox & Rial-González, 2000). It has been debated whether self-reported data represent a better predictor of employee well-being rather than objective measures due to the cognitive appraisal processes involved in the work-related stress (Bosma, Marmott, Hemingway, Nicholson, Brunner & Stansfeld, 1997; Jex & Spector, 1996; Spector, 1987). Campion, Papper and Medsker (1996) found in their study on team effectiveness that employee self-reports were a better predictor of the relationship between team characteristics and team effectiveness than were managers' judgements. They hypothesised that this may be due to the fact that employees have a better knowledge of the team characteristics, i.e. they are experts in their jobs, or that employees' perceptions of their working conditions may influence the level of productivity and satisfaction.

As mentioned earlier, this thesis builds on the first stages of the risk management approach, especially the work systems analysis interviews and the risk assessment survey. The following section describes in detail how data were collected throughout the two stages.

Work Systems Analysis

Semi-structured interviews were conducted with a structured sample including different types of jobs and levels of employment in both organisations. From each team, one employee, or in larger teams two, was randomly selected from a list of all employees by the author or her colleagues and was subsequently invited for an interview. Each interview lasted between one and two hours. Interviewees were informed about the purpose of the project and the interview and reassured about anonymity and confidentiality. During the interviews, employees were asked open-ended questions about their work and that of their colleagues, and asked to identify the major problem areas experienced by them and their colleagues, and describe the positive aspects of their work. Finally, they were asked about how these aspects of work may relate to their own and their colleagues' general health and well-being. The aim of the interviews was three-fold: (1) To obtain a detailed understanding of the work carried out in the department and the organisational culture, (2) to gain knowledge of the positive and negative aspects of the working conditions in the organisation, and to gather data on possible hazardous health outcomes of these negative working condition in order to design the questionnaire, and (3) to interpret and understand the findings from the analyses of the questionnaire. In case study A, 21 employees were interviewed at engineer, supervisor and management level. In case study B, 18 employees working in self-managing work teams were interviewed along with directors. The interviews formed the basis for the development of a questionnaire tailored to address the negative and positive aspects of the work experienced by participants. In both organisations, teamwork was mentioned as a positive aspect of work in that it provided opportunities for learning and for working closely with colleagues. However, in case study B, problems were also identified in that teams reported that for some managers, self-managing meant that teams would receive no support from management of any kind and were left to their own devices. Based on these reports, it was decided to include specific measures of teamwork in the two organisations.

Risk Assessment Survey

Using the data from semi-structured interviews and organisational documentation collected during the scoping stage, a context-specific questionnaire was designed that reflected the working conditions in detail in the population. Before the questionnaire was distributed, it was agreed with the Steering Groups in the two organisations -- see section 3.1.1 for a description of the participatory processes supporting the risk management strategy (Randall, Griffiths, Cox & Welsh, 2002; Cox et al., 2000; Cox & Rial-González, 2000a; Cox & Rial-González, 2000b; Cox & Ferguson, 1994). Respondents were assured that the questionnaire would be treated confidentially and that individual responses would not be reported back to the organisation. A stamped envelope was included for the return of the questionnaire directly to the research team. In organisation A, the author would be present at the organisation for respondents to return the questionnaire personally and ask questions. See appendix 1 for a "masked" version of the questionnaires.

Each participant in the two studies completed a questionnaire that contained demographic data, ratings of their working conditions and their health. The questionnaire comprised four main sections: Demographic data, measurement of psychosocial factors, employee health and well-being and teamwork measures:

- **Demographic data.** Demographic and work-related data (e.g. age, gender, number of years in department and organisation, job title, overtime and team membership) were included in this section.
- **Measurement of psychosocial factors.** The measurement of the working conditions was driven by the construction of context-specific items designed to reduce cognitive and emotional processing biases (Frese & Zapf, 1988; Kristensen, 1996). This section, building on Cox (1993), consisted of items addressing physical environment, work equipment, social climate and interpersonal relations, work

pressures, work demands, control over work, participation, management style, work role, work/home balance, pay and promotion. In case study A, 105 questions items were designed. And in case study B, 89 items were identified. Respondents were asked to rate each item according to whether the item was non-applicable, problematic, good, or neither problematic nor good. It has been questioned whether a frequency scale captures the transactional process (Dewe, 2000). By using a problematic scale, the transactional process between person and environment was examined capturing the primary appraisal process (what does this encounter mean for me?) as described by Lazarus and Folkman (1984). Researchers have been accused of bias in selecting measures of stressors, which are convenient to them and/or with which they are familiar without considering whether these are appropriate for the current sample (Ivancevich & Matteson, 1987). By basing this section of the questionnaire on interviews and organisational documentation investigating these psychosocial factors, such bias was avoided. However, the disadvantage is that items have to be analysed separately if the sample is not large enough for conducting factor analysis, which was the case in this study A. On the other hand, single-item analyses have been found to be reliable (Wanous, Reichers & Hudy, 1997; Wanous & Reichers, 1996) and to minimise item bias (Orhede & Kreiner, 2000).

- **Employee health and well-being.** This section measured various aspects of employee well-being and health. It included among others: *The General Well-Being Questionnaire (GWBQ)* (Cox, Thirlaway, Gotts & Cox 1983). This questionnaire consists of a list of 24 non-specific signs and symptoms of sub-optimal health, each assessed by a five-point Likert scale. The questionnaire consists of two scales: 12 items measuring tension/anxiety defined as symptoms of worry, fear, tension and physical signs of anxiety, and 12 measuring feelings of exhaustion defined as tiredness, emotional lability and cognitive confusion. The higher the participants score on the questionnaire, the

lower their well-being. In case study A, both scales were included, whereas in case study B, only the exhaustion scale was included in the questionnaire. The twelve items were summed for each scale, yielding scales with internal consistencies (Cronbach's alpha, α) of, respectively, .82 and .86 in case study A. The two well-being scales correlated with .74** ($p<.01$). In case Study B, an internal consistency of $\alpha = .89$ was found for the exhaustion scale.

Job involvement was measured using four items from the job involvement scale developed by Lawler and Hall (1970) ($\alpha = .74$). Items included in this study concerned participants' ratings of their job's importance in their lives and how much they felt they gained from their jobs. The scale was applied in case study B.

Intention to leave. In case study A, respondents were asked to indicate whether they were planning to leave the organisation.

Job satisfaction. Included in this section was also one item regarding overall job satisfaction, measured on a four-point Likert scale in case study A and a five-point Likert scale in case Study B.

- **Teamwork-related measures.** In addition to the measures traditionally included in the risk assessments conducted by the Institute of Work, Health and Organisations, a number of scales were included the questionnaires, specifically relating to teamwork. In case study A, two measures of teamwork were included:

  The Team Interdependence Questionnaire developed by van der Vlegt et al. (1998). This questionnaire measures task and outcome interdependence. Both task and outcome interdependence have been found to be important for team effectiveness (Wageman & Baker, 1995). It consisted of 14 items: 4 items measuring the degree to which the respondent depended on his or her colleagues for carrying out his or her individual task, 4 items measuring the degree to which colleagues depend on the respondent for carrying out their work (both measured on a five-point Likert scale) and 6 items measuring dependence on outcome interdependence. Participants were asked to

report e.g. the degree to which team colleagues achieved their goals benefited or hindered the achievement of their goals. This was measured on a seven-point scale. Items were added up to form an overall scale of team interdependence yielding an internal consistency of $\alpha = .75$ when one item was excluded.

The Team Climate Inventory - short version (TCI – short) by Kivimäki and Elivainio (1999). West (1990) and Kivimäki and Elovainio (1999) has defined the following four aspects of team climate:

Vision: The degree to which the team has clear and realistic objectives.

Participative safety: Team members work together in a participative, non-threatening environment where they feel part of a unit and share information.

Task orientation: A climate where team members commit to high standards of task outcome and address weaknesses ensuring continual improvement.

Support for innovation: Team members co-operate to develop and apply new ideas.

The TCI – short includes four items for vision and participative safety and three items for task orientation and support for innovation. Each scale was summed and yielded internal consistencies of respectively, $\alpha = .76$, $\alpha = .90$, $\alpha = .83$ and $\alpha = .70$.

In case study B, three measures related to teamwork were included in the questionnaire:

Opportunities for learning and innovation (Learning and innovation) were measured by a 6-item scale ($\alpha = .76$) developed from a Swedish questionnaire by Brenner and Melén (2000). Items measured employees' perception of learning from experiences and innovation in their jobs and personal development. Examples of measures were: "Working within a team, I develop new ideas for work", "I learn from my work" and "I feel as though I am constantly developing in my work".

Also included in this section was a scale on *management's attitudes towards learning and innovation in teams* (Supportive Management) were measured by a 6-item scale (α = .86) also developed from the Swedish questionnaire of Brenner and Melén (2000). The scale measured management's attitudes toward learning and innovation and the degree to which management supported and made use of such opportunities. Measures of this scale included: "My managers respect my skill and knowledge", "My managers encourage learning" and "The management quickly responds to suggestions and uses them".

SMWT scale. A four-item scale to measure whether teams fit the definition of SMWTs was developed by the author in case study B. Items included "In my team we work on a joint task", "As a team we are responsible for completing a specific well-defined task", "As a team we decide which methods and procedures to use when carrying out tasks" and finally "Within my team we allocate responsibility for specific elements of the task around members of the team". The scale yielded an internal consistency of α = .73. Factor analysis were carried out using varimax rotation and the results are shown below in table 3.2:

Table 3.2: Item loadings for the SMWT scale

Item	Loading
In my team we work on a joint task	.68
As a team we decide which methods and procedures to use when carrying out tasks	.80
As a team we are responsible for completing a specific well-defined task	.71
Within my team we allocate responsibility for specific elements of the task around members of the team	.74

3.3 Assessment Samples

The focus of this thesis is the investigation of teamwork in engineering and related disciplines engaged in product development and management. It has previously been found that the working conditions may differ depending on the occupation in which teamwork is introduced (Sparkes & Cooper, 1999). Engineers are highly educated and have traditionally more control over their work. Teams must be analysed in their context and careful attention should be paid when transferring knowledge obtained from teams in one setting to teams in other settings (Devine, Clayton, Philips, Dunford & Melner, 1999).

The first case study, A, was a major international car design and manufacturing company. One department took part in the study, involved in designing new cars. The whole department was located in the South of England with the vast majority of employees situated in one location. The department employed 90 engineers engaged long-term in product design and organised in temporary teams. At the time of study, these teams had existed for a sufficient period for team members to develop a team identity (two years). According to interviews, the teams met the criteria for teamwork discussed in the introduction. Teams had an average of 8 members. All teams had a supervisor who would make all major decisions. Participants were largely male (84%). Eighty-one percent were younger than 45 years of age. 19% of the respondents were employed at supervisor or managerial level. The educational level was high with 30% at HNC level, 38% having a first degree and 32% at postgraduate level. All were employed on a full-time contract and were at engineer, supervisor, or departmental manager level. On average, employees worked 8 hours overtime each week.

The second case study, B, draws from work conducted with SMWTs in the engineering sector in the Netherlands and the US. The sample consisted of 156 employees across the organisation. Participants were largely male (75%). The average age was 41 years. They were working in permanent teams engaging in the task of developing and selling projects across the world. According to

interviews, SMWTs met the criteria outlined in the introduction. Each team had a leader who, in addition to ordinary team tasks, would be responsible for coordinating and communicating with other levels and areas across the organization. The teams were divided into two major departments: One department engaged in planning the overall budget of projects and acquiring information from clients and project and support groups. The other department engaged in the technical planning and monitoring of projects and ensuring that projects were cost-efficient.

3.3.1 Description of Teamwork within the Two Case Study Organisations

As outlined in the introduction, there are many types of teams in organisations. Before describing the research which forms the basis for this thesis, it would be useful for provide an in-depth description of the type of teamwork investigated. Appelbaum and Batt (1994) have pointed out the lack of consideration of the differences between different types of teamwork and how these differences may influence employee health and well-being. It is therefore important to pay careful attention to the type of teamwork investigated and consider how this may affect results. This section describes how the teams under investigation in this thesis a) differ from other kinds of teams and b) differ from each other in the two case studies.

Characteristics specific to the teams under study

Below are described a number of characteristics that distinguish the kinds of teamwork applied in the two case study organisations from other kinds of teamwork.

- **Focus on core tasks**

  An important characteristic is the purpose of the team. Is the team's core task carried out as the main part of the job for employees, or is it a task additional to individuals' jobs? (Cotton, 1993). For example, quality circles and advisory groups may meet on a regular basis or

discuss and make suggestions for improvements. Whether team members only meet to discuss issues or are jointly responsible for carrying out the main task evidently has implications for how they work together and the degree of interdependency. Further, whilst core task teams have been found to carry permanent positive benefits if implemented correctly, the positive effects of quality circles tend to wear off with time (Cotton, 1993). The teams in this thesis are all core task teams.

- **Information or production teams**

  One of the key criteria for teams is their output. The teams described in this thesis all dealt with processing information and developing a new product (in case study A, teams were engaged in car design and in case study B they were engaged in planning and monitoring projects), as opposed to producing goods. This distinction has been made by Devine, Clayton, Phillips, Dunford and Melner (1990) and is interesting, as most research has been carried out in manufacturing teams, which naturally produce goods.

- **Standardised procedures of team task**

  There are different degrees of standardisation of procedures within teamwork. For "lean production teams" the basic idea is to streamline the procedures to such a degree that team members are left with little or no control over how they plan and carry out the task. This has been found to have implications for employee well-being as control is minimised (Parker & Williams, 2001). The teams under study in this thesis all had a low degree of standardisation.

- **Diversity in Teams**

  Multidisciplinary teams are defined as teams where members have different technical backgrounds, e.g. one might be a social worker, a psychologist, a nurse and a medical practitioner. Each brings to the team their specific expertise and it is expected that they can succeed in sharing and applying each individual's knowledge to the benefit of the team (Jackson, 1996). However, it has often been found that such effects are not found, or that, although the team is found to be

productive, negative side effects are found in terms of unproductive conflict or high turnover (Jackson, 1996). One reason for these negative effects may be issues to do with diversity. Team members may not share the same perspective or even the same language.

The term diversity is used to describe the composition of employees or in this case team members and refers to demographic information such as tenure, gender, ethnicity, social status, education and age but also functional diversity in terms of varying roles and responsibilities and positions. Diversity is an increasing issue in many organisations in the Western world, as many organisations experience changes in their workforce from largely employing white middle class males to increasingly recruiting other ethnic groups and women (Jackson, 1996). In addition, in order to deal with the increasing competition, companies merge, nationally and internationally, which also brings about a diverse workforce with different nationalities and cultural backgrounds (Kanter, 1989). However, when analysing diversity in teams, it is important to focus on the different components of diversity: teams may be homogenous when it comes to the level of education but diverse in gender, age and cultural backgrounds. Andrews (1979) (in Agrell & Gustafson, 1996) identified no fewer than 70 types of diversity. The design and organisation of such a team should naturally be different from a team where members share the same cultural background, are of the same gender or age but do not have the same level or area of education (Jackson, 1996).

In the case studies described in this thesis, both forms of diversity were found to occur. In case study A, members of teams were mostly British, however some had other ethnic backgrounds, mainly German or American. Additionally, female engineers were increasingly considered a target for recruitment in order to attract and maintain qualified labour. However, they were still a minority and problems were experienced with keeping female engineers after childbirth. However, bi-polar teams were also experienced in that the recruitment strategy had changed in recent years. Years ago,

engineers had been trained through vocational training whereas in recent years focus had changed to recruiting engineers with a minimum of a BSc. Sixty-five pecent of engineers had a university degree. Diversity in teams has been found to influence working conditions in a variety of ways:

Decision making and problem-solving. Research indicates that a high degree of team diversity leads to efficient team decision making strategies. The availability of expertise in teams does not necessarily guarantee that such expertise is fully used. Research on conformity shows that if one member of a group possesses the right answer, he/she may not put forward their opinion regardless of whether it may be right or not (Asch, 1956).

Status. Differences in individual team members' status determine whether their opinions are heard. Demographics such as age, gender, cultural background and education are all likely to influence the status of the individual member within the group. Making this effect even stronger is the fact that higher status members of a team often speak more, question decisions more and exert more influence than other team members (Levine & Moreland, 1990).

Implementing decisions. In cases where teams have not reached a consensus decision that individual members of the team can buy into, diversity may slow down efficient implementation of decisions, as members of the team may not feel strongly about the success of the decision. On the other hand, in cases where team members feel strongly about the decision they may monitor the implementation closely, thus ensuring successful intervention (Jackson, 1996).

Cohesiveness. Cohesiveness refers to the degree to which individual team members like each other and feel part of the overall team. Teams with a high degree of cohesiveness have been found to facilitate communication, co-operation and decision-making and in the longer term, turnover (Brass, 1984).

Management. Ginsberg (1990) emphasises the importance of managers with strong leadership skills in diverse teams. Team leaders

should ensure that team members have a clear vision, clear objectives and provide a climate in which employees are able to communicate and discuss freely. Allowing disagreements to be discussed openly can lead to high quality decision making where all team members' opinions are heard and team members' experiences are used. Team members should reach agreement through consensus and viable solutions may be created through the construction of shared understandings.

Differences between teamwork in the two case studies

This section outlines the main differences between the two types of teamwork in the case studies:

- **Degree of autonomy**

  As mentioned in the introduction the teams in the two case studies varied in the degree of autonomy. A brief distinction between self-managing work teams and Japanese style teams was presented in the introduction. However, these are not the only types of teams present in today's organisations. Banker, Field, Schroeder and Sinha (1996) outline five different kinds of teams in production according to their degree of autonomy:

  1) Traditional work groups with little autonomy but where group members carry out core production activities, while other groups are responsible for support activities such as maintenance and quality.
  2) Quality circles where members meet on a regular basis to discuss production problems and suggest solutions to management.
  3) Semi-autonomous work groups: team members are responsible for support activities such as maintenance and quality control at the same time as being responsible for core production tasks.
  4) SMWTs where team members have a high degree of autonomy regarding the management activities of their group, such as

budgeting and planning, in addition to the responsibilities of semi-autonomous work group.

5) Self-designing teams where team members have complete control over the design of teams, i.e. the number and membership of teams and which tasks to conduct.

Transferring these classifications onto the teams under study here, case study A can be said to have teams with a degree of autonomy lying somewhere on the continuum between work groups and semi-autonomous work teams. Teams did not have a great degree of autonomy but were nevertheless responsible for quality control themselves. In case study B, teams can be said to be somewhere between SMWTs and self-designing teams, in that all teams had a high degree of autonomy and could request more staff being employed if they felt it necessary, furthermore, some teams were also responsible for acquiring new projects. However, the classification by Banker et al. (1996) is problematic: the teams described differ in terms of interdependency and the task (primary vs. secondary), which makes it difficult to place teams along this continuum.

- **Type of leadership.** Manz and Sims (1992) have outlined a range of leadership styles, arguing that a special type of leadership skills is required to manage self-managing work teams. They distinguish between four types of leadership: the strong man (whose power rests on position/authority), the transactor (whose power relies of his or her control over rewards), the visionary hero (whose power is based on his or her inspirational skills, and, finally the superleader who shares power with his or her followers -- they avoid the word "subordinates". In case study A, the leadership was mainly based on the inspirational leadership style, where one important aspect of the leadership role is to communicate the organisations' vision and objectives to team members. Each team had a supervisor who acted as the link between the team and other teams and upwards in the system. In case study B, where SMWTs had been implemented, the

role of the team leader was to encourage team members to make their own decisions and learn from their experiences. Evidently, teams that are not adequately managed and supported may not carry the potential benefits for employee well-being (Nielsen, 2000).

- **Temporary versus permanent teams**

  Mueller, Procter and Buchanan (2000) have emphasised the importance of considering whether teams are permanent or temporary. The teams in case study A were temporary teams involved in designing a new car in a time span of about four years. At the time of study, teams had existed for two years. Teams in case study B were of a permanent nature. However, it has to be noted that a policy within the organisation required employees to change jobs every four years. This meant that team membership was changing continually. There are two reasons for focusing on the time aspect of project teams: First, teams are established to deal with shorter projects and one may encounter sub-projects either consisting of several parallel projects or series of projects which are partly overlapping. This may very well have implications for cohesion, norms and how team members deal with conflicts with evident effects on employee well-being. This will have implications for how they perceive their working conditions and thus well-being (van Offenbek & Koopman, 1996). Second, the level of "maturity" is important. Tuckman (1965) developed a model of five stages that a group go through: Forming (team members meet and get to know each other), storming (team members fight for power), norming (the team starts to develop its own norms and values that form the foundation for effective collaboration), performing (where the team members collaborate efficiently), and finally the adjourning phase where the group is dissolved. The stage at which a group or a team is at a given point in time obviously affects performance and employee well-being.

- **"Virtual teams"**. The outlook of organisations has changed over the past decade with increasing multinationalisation and information technology. Video conferences, voicemail, the internet and intranets

have enabled people to work together although they are not physically situated in the same geographical area and are working across time zones (Parker & Williams, 2001; Benson-Armer & Hsieh, 1997). In case study B, some teams were situated in both the Netherlands and the US. Such teams have been named "virtual" teams to emphasise their lack of geographic togetherness. However, human relationships remain essential if teams are to function optimally. Although team members are able to communicate, it is not certain the degree to which they develop shared goals and objectives or agree on such, although they have been identified. Further, problems exist across different time zones making efficient communication difficult. Although video-conferencing is possible it is still difficult for team members to analyse and interpret non-verbal communication. Often, team members may experience conflicting or a double load of demands from their "virtual" team members and managers in the geographical locations. This becomes even more of a problem where employees are members of several teams at any one time. The concept of "shared space" is essential. Team members must have complementary skills, have shared goals and objectives and a common approach to how work is conducted. However, a common purpose is as important and can be difficult to achieve if team members are not working together on a project (Beson-Armer & Hsieh, 1997). This naturally creates problems in terms of communication and cohesiveness. Armstrong and Cole (1996) describe how such virtual teams create challenges in how the teams are designed, managed and organised in order for them to function optimally.

3.4 Summary and Conclusion

The data in this thesis were collected as part of a risk management strategy based on participatory principles. This strategy has the advantage of ensuring that the results are validated through feedback to main key stakeholders as experts on organisational issues. Data used in this thesis were collected during

the initial phases of the project through semi-structured interviews and risk assessment surveys. In the risk assessment survey, specific measures of teamwork were included. For triangulation purposes, existing organisational information was also used to support the findings.

The two case studies were both major international companies employing mainly engineers, but in the second case study also others with university education.

The two case studies shared a number of teamwork characteristics: In both organisations, teams were engaged in a completing their core tasks: they were both engaged in information processing rather than manufacturing: they both had a reasonably low degree of standardisation in their procedures. Finally, they both showed a fairly low level of diversity in terms of gender, education and nationality.

However, the teams also differed from each other in a number of ways: teams in case study B had a higher degree of autonomy and had "virtual" teams. Further case study A employed temporary teams, whereas the teams were permanent in case study B. The management style varied in the two case studies due to the higher degree of autonomy in case study B.

4. Health Profile and Psychosocial Hazards in Teamwork

This chapter outlines current theory on how working in teams may influence employee well-being. This is followed by a description of the health profile of employees working in the two organisations. The chapter then describes the negative and positive aspects of work identified by employees in the two case studies. These are related to existing theory of psychosocial hazards in the two types of teamwork. Finally, it is discussed whether any of the differences between the two case studies may be due to the type of teamwork applied in the two organisations.

4.1 Introduction

As can be seen in the literature review, it has been suggested that employees benefit from working in teams in that teamwork increases opportunities for social support and offers opportunities for skill development and a more challenging job (Firth-Cozens, 1998; Parker & Whybrow, 1998; Parker & Wall, 1998). Such conditions might reduce stress and maintain or improve well-being (Cox, Griffiths, Barlow, Randall, Thomson & Rial-González, 2000). However, the picture is not clear-cut; negative aspects of working in teams have also been predicted (van Mierlo, Rutte, Seinen & Kompier, 2001; Parker & Whybrow, 1998, Parker & Wall, 1998; Quick, Paulus, Whittington, Larey & Nelson, 1996). In addition, many of these hypotheses are based on teamwork in manufacturing. It should be investigated whether these are transferable to professional settings. Outlined below is how working in the two types of teams may influence employee well-being:

1. *Workload.* As employees become increasingly multiskilled, they will have an increasing number of tasks to complete throughout the working day. This is

especially thought to be the case for SMWTs; they will not only have an increasing number of horizontal tasks to complete but also an increasing number of vertical – managerial – tasks. A high workload is thought to be an apparent negative effect of teamwork as one of the basic ideas held by senior managers is that fewer people can do more work (Cotton, 1993). Another side effect of multiskilling is that breaks are less likely to occur because team members can carry out more tasks and do not have to wait for external or internal assistance in case of break-down, or, in the case of information teams, the information necessary to carry out the team task should largely be embedded within the team structure. However, multiskilling may also mean that employees with a consistently high workload may benefit from colleagues learning the skills required to do their jobs so they can help out.

2. *Time pressures.* In an ever-changing environment, where "time is money" it is likely that team members will experience increased time pressures as the demand to meet deadlines shifts from supervisors to team members. This is predicted to be the case especially in SMWTs where team members may be responsible for setting and negotiating deadlines themselves. On the other hand, Ulich and Weber (1996, p. 252) hypothesised that as SMWTs became responsible for scheduling their work, they would be able to plan their work better, which would offer increased opportunities for "reflection and desired interactions".
3. *Communication.* Internally, communication is thought to improve, as team members work closer and have increased opportunities to communicate. However, the close intra-group feeling may have detrimental effects on communication across teams. Nielsen (2000) found in a qualitative study that teams may compete against each other and be reluctant to share information in order to protect themselves and the team identity.
4. *Physical environment.* The physical environment is thought to improve in SMWTs if team members have the autonomy to organise the physical environment in a way that facilitates communication and co-operation.

5. *Decision latitude/control.* It is believed that shifting power to the team level means that team members will experience increased autonomy. However, others have raised the concern that because employees have to co-ordinate with other team members, a negative side-effect may be reduced individual autonomy (Barker, 1993).
6. *Work content.* It is believed that multiskilling will result in increased task variety and more interesting jobs, especially in SMWTs because team members also take over managerial tasks. However, the cognitive demands of the job may increase to a level where it is no longer healthy for the individual. Emery (1959) was aware of the importance of a match between the worker's skills and the difficulty of the task and he emphasised that "the knowledge that a skilled man brings to a job enables him to make choices between alternative modes of operation that are not obvious to an unskilled man". According to Warr's vitamin model (1994), increased work demands may have positive benefits in terms of providing individuals with increased opportunities for learning and personal development. However, when there is a mismatch between the individual's skills and abilities, this may have negative effects on employee health and well-being (Karasek & Theorell, 1990). Teamwork puts forward demands on the individual to 'rock the boat and co-operate' (Quick, Nelson & Quick, 2001). Teamworkers should be able to lead themselves and be innovative (Quick, Nelson & Quick, 2001). Such demands may exceed the skills of employees who have not previously worked in a challenging environment. Theorell (2001) claimed that cognitive demands have replaced the role of physical demands, which were dominant in the early years of stress research because manufacturing has declined over the last two decades.
7. *Interpersonal relationships.* It has been widely assumed that working in teams brings about increased opportunities for social support (Guzzo, 1996; Ulich & Weber, 1996; Firth-Cozens, 2000;1998). However, negative effects on interpersonal relations have also been predicted. Theorell (2001) outlined

the potential detrimental effects of increased social contact in terms of increased interdependence and the novelty of working with others. However, in the very same chapter, he also emphasised the potential positive benefits for employee well-being. One problematic aspect of interpersonal relations is that of increased peer pressure. When team members are jointly responsible for a task, peer pressure on members, for example, not to be absent may become stronger as this would result in increases in other team members' workload. Further, being dependent on other team members in order to complete one's goals and complete tasks may lead to less tolerance for other team members' problems. Barker (1993) found that as control shifted from management to fellow team members in SMWTs, team members developed powerful internal systems, values and norms, which acted as concertive control over team member behaviour. At times such control became tighter than that exerted by management. Nielsen (2000) found the same in her study of SMWTs in Denmark. Firth-Cozens (2000), in her discussion of the changing workplace emphasised the increase in cognitive demands due to the introduction of new technology and the increased job insecurity that followed the recession and unemployment of the early 1980s. Personal relationships seem to suffer as new technology changes the way we communicate (see section 3.1.6 on virtual teams): people are stretched to the limit and change jobs more frequently.

8. *Management.* As employees become more empowered, better skilled and feel more responsible for their work, they are thought to interact with management at a more equal level (Trist, Susman & Brown, 1977). Manz and Sims (1992; 1987) emphasise the importance of actually managing SMWTs (see section 7.1). However, the relationship between management and teams may be problematic if management feels threatened by empowered employees and is reluctant to pass on the necessary skills to employees and delegate tasks to team members either because they fear that they may lose power or because they do not trust employees. Management functions as the communication

link between teams and management. Nielsen (2000) found in her study that where middle managers were resistant to SMWTs, they could stop the whole process if they did not pass on information. This may be the case especially in SMWTs.

9. *Roles and responsibilities.* As employees become multiskilled, their job description is bound to change as their tasks are broadened to cover more (sub)tasks. Consequently, the job description must be formulated in a manner that is sufficiently vague to embrace this broader role. However, such a job description may lead to confusion.
10. *Career opportunities.* As the number of managerial positions is reduced in SMWTs, it is evident that there are fewer opportunities to be promoted to such positions. This may lead employees to feel that there are no opportunities for progressing within the company.
11. *Job security.* In SMWTs, dismissal is an apparent threat to supervisors as their positions are changed to that of coach. First, because fewer supervisors are required and, second, because supervisors may have problems adapting to the new role of supporting team decision making rather than making decisions themselves (Manz & Sims, 1987). Also team members may feel threatened if they find it difficult to work closely with others or take on additional tasks and acquire new skills.

However, as indicated in chapter 2, little has been done to verify whether these factors are present in organisations with various types of teamwork, because traditionally research has tended to focus on the variables being manipulated with little effort made to understand how work characteristics change under a teamwork structure, and how these translate from the manufacturing setting into the professional setting. This chapter provides a health profile of the two case studies and identifies possible psychosocial hazards present in the two organisations in question and identifies the positive aspects of work.

4.2 Employee Well-Being and Working Conditions in Teamwork

The description of the health profile and the working conditions in the two case studies follows the strategy applied in the risk management approach described in section 3.1. It consists of five sections:

- Employee health
- Psychosocial hazards in case study A
- Positive aspects of work in case study A
- Psychosocial hazards in case study B
- Positive aspects of work in case study B

They are described in detail below:

4.2.1 Employee Health

This section outlines the health profile of employees in the two organisations. The same measures were not used in both organisations, which limits the opportunities to compare the two organisations. However, comparisons are drawn wherever possible. For the GWBQ measures, population data were available, making it possible to compare with a British population of professionals. The job satisfaction measures were different in each case study: a four-point Likert scale was used in case study A, and a five-point Likert scale in case study B. To compare the level of satisfaction in each organisation the four-point Likert scale was transformed into a five-point Likert scale. The health profile is summarised in table 4.1.

Table 4.1: Health profile

Measure	Organisation A (mean)	Organisation B (mean)	British Professionals (mean)
Job satisfaction (1-5)	3.13***	3.52	
Exhaustion (0-48)	18.67**	18.56***	15.87
Tension (0-48)	7.16***		9.92
Intention to leave (0-1)	.54		

**p < .01 level, ***p < .001 level

As can be seen in table 4.1, both organisations scored relatively high on job satisfaction. However, employees in organisation B were significantly more satisfied with their jobs. If the figures are broken down in percentages, 58% of employees in case study B were either satisfied or very satisfied with their jobs whereas this was the case for 48% in case study A. Both groups were significantly more exhausted than the British population mean for professionals. On the positive side, employees in case study A were significantly less tense than the norm group. Forty-six percent of employees wished to leave the company if given the opportunity.

4.2.2 Psychosocial Hazards

In order to identify psychosocial hazards in the two samples, three methods were used according to the risk management approach (Rial-González, 2000):

- Frequencies: The most basic method is that of frequencies. The rationale behind this is that if more than half of the sample reported a work characteristic as a problem this must be seen to affect staff. Consensus is sought by using a cut-off point of 50%, thereby moving away from subjective perceptions of employees.
- Estimated relative risk: While correlations take the scores of each individual as the data case and establish associations at the individual level, Odds Ratios (OR) take group-based frequencies allowing associations to be examined at the level of the whole group. OR indicate the likelihood of having a particular negative health outcome in a group

reporting a working condition to be problematic relative to those who are reporting the working conditions as being adequate. ORs were calculated to identify likely risk factors (psychosocial factors related to poor health rather than just reported problematic by the majority) thereby giving a group-level association appropriate to an expert judgement on work characteristics. (Cox et al, 2000, Rial-González, 2000). For psychosocial factors, a problematic/negative response was coded 1 and the neutral and positive responses were rated 0. For well-being outcomes tension/anxiety and exhaustion, responses were dichotomised according to the mean for the population. Job satisfaction and intention to leave were dichotomised into positive and negative responses. For all, the negative outcomes were coded as 1 and the positive as 0. Statistical significance of any associations between health and psychosocial factors is often determined using likelihood ratio chi-square tests (Howell, 1997). However, the p value associated with chi-square depends on the size of the sample, the strength of the association and the magnitude of the difference between groups. Therefore it is also advisable to calculate 95% confidence intervals for each OR. If there is no relationship between reporting a working condition either problematic or unproblematic and a given outcome, the OR is 1. An OR above one represents a positive relation between a problematic working condition and a well-being outcome. For example, an OR of 5.9 means that the group reported a working condition problematic are 5.9 more likely to report a given outcome (Rial-González, 2000). By using ORs, risk assessments try to identify specific instances of the existence of a given hazard in a given work environment, and to estimate the likelihood of harm occurring from these hazards for the assessed group at a given point in time. It does not attempt to establish causality nor does it attempt to build theoretical models, like other statistical methods such as logistic regression do: the

aim is to establish which specific aspects of the working environment are related to poor well-being (Rial-González, 2000).

- Qualitative data. For each of these findings, the background is described using information gathered during the work systems analysis and discussions with the Steering Group(s) and key stakeholders.

4.3 Relationship between Psychosocial Hazards and Employee Well-Being

In this section, the possible psychosocial hazards in the two types of teamwork are identified. When conducting the ORs for the two case studies, different outcome measures were used depending on the measures included in the questionnaires.

Tables 4.2-4.12 show the frequencies above 50% and results of the ORs divided into well-being outcomes tension/anxiety, exhaustion, and job satisfaction. Four different combinations are possible:

- A psychosocial factor may be neither problematic for the majority of the group nor significantly related to a health outcome. These are not reported in this chapter but all items included in the questionnaires can be found in appendix 1.
- A psychosocial factor may not be problematic for the majority of staff but, for a minority, be related to poor well-being.
- A psychosocial factor may have been identified as a problem for a majority of staff but not related to health.
- A psychosocial factor may be both problematic and related to poor health.

To facilitate readability, the psychosocial hazards have been clustered into the organisational pathologies – underlying problems. These underlying processes

may help create the problems reported in the survey. These clusters are identified in conjunction with the results of the interviews and through discussions with key stakeholders in the organisations and should not be seen as scales. In case study A, the clusters were identified through a series of meetings with the Steering Group consisting of supervisors and engineers. In case study B, the clusters were identified through Action Innovation Process workshops with the individual self-managing work team. Clusters do not follow the same grouping as the hypothesised psychosocial hazards mentioned earlier: the emphasis is made on telling the story of the organisation rather than how this fits with current theory. At the end of each cluster, it is discussed how the cluster relates to theory. The tables report the frequencies and the ORs for job satisfaction, exhaustion and, in case study A, also intention to leave and tension.

4.4 Psychosocial Hazards in Case Study A

This section outlines the psychosocial hazards identified in case study A, where employees were working in teams. In tables 4.2-4.7, the frequencies and ORs are reported. Due to the large amount of items in the questionnaires, only significant findings are reported.

Five possible pathologies emerged, the first three (performance framework, time, and communication) were interrelated and the last two (the reward system and career development) might create an unhealthy context for the former.

4.4.1 Management in Case Study A

The first underlying pathology was related to management. In table 4.2, the psychosocial hazards related to management are reported.

Table 4.2: Management in case study A

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Lack of control over workload	53%	2.82* 7.33***	1.01-7.60 2.35-22.88	Job satisfaction Tension
Information not received in good time about directional changes	62%			
Meeting conflicting demands and targets from various areas	52%			
Lack of prioritising between objectives	50%	3.23*	1.12-9.30	Intention to leave
Unrealistic targets	75%	4.76*	1.18-19.15	Tension
Unrealistic deadlines	75%			
Late product changes	77%			
Opportunities to see the results of my work	14%	9.92**	1.16-84.70	Job satisfaction
Clarity of roles and responsibilities	35%	4.43**	1.44-13.60	Job satisfaction

*p < .05, **p < .01, ***p < .001

Designing a new car takes place in a competitive and fast-changing environment that requires a high degree of flexibility to adjust to the reality of external demands. However, employees could also perceive this flexibility as lack of management.

It was reported that management was inconsistent in their decision making. 62% reported that they did not receive information in good time about directional changes. In addition, once decisions were made, they were not final: product changes are made even at a very late stage (77% of the sample). A result of this was thought to be lack of clear roles and responsibilities. Those who experienced lack of clear roles and responsibilities were over four times more likely to be dissatisfied with their jobs than those that did not. Adding to the issues of lack of clear roles and responsibilities: those reporting a lack of opportunities to see the results of their work were almost ten times more likely to be dissatisfied with their jobs.

Another related problem appeared to be that of setting an appropriate performance framework. 75% reported having both unrealistic targets and deadlines. Moreover, there was a lack of prioritising between objectives (reported as problematic by 50% and those reporting this as a problem were more than three times as likely to want to leave the organisation) and employees were expected to meet conflicting demands and targets from various areas (reported as problematic by 53%). Engineers believed that they had little decision latitude and tended to rely on management to make decisions (53% of all staff). This made it even harder for employees to meet targets and deadlines, increasing time pressures.

Comparison to theory. As becomes apparent from this section, the relationship between management and employees was problematic. It was felt that management did not provide clear guidelines and employees' roles were not clear. This has been predicted by current theory as described earlier, in that job descriptions are not as clear when team members are expected to take on more tasks. However, it may also be due to the fact that the participants in the study were professionals rather than workers on the assembly line, where job descriptions may traditionally be more clearly outlined. As responsibility for task completion shifts from management to team members, this may lead to more pressure on team members. However, many of the problems here were not put down to teamwork per se, but rather to a management that were seen not to have control over the situation – a problem experienced by many of today's organisations in a competitive, fast-changing environment.

4.4.2 Time Pressures in Case Study A

A second pathology seemed to be that concerned with time pressures.

Table 4.3: Time pressures in case study A

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Pulling the programme ahead	56%			
Constant time pressures	51%			
Little time available for "actual engineering work"	64%			
A high workload	36%	3.75*	1.29-10.94	Tension
Opportunities to take breaks during working hours	27%	3.16*	1.01-9.84	Intention to leave
A lot of time spent in meetings	38%	4.78**	1.61-14.18	Job satisfaction
Poor experience and training of contractors	52%			
Opportunities to combine travelling and home life	38%	5.41** 4.85**	1.82-14.36 1.64-16.12	Intention to leave Exhaustion
Fitting in social activities outside work	43%	3.51* 5.25***	1.24-9.92 1.80-15.29	Tension Exhaustion
Fitting family life around working hours	38%	3.60* 3.64*	1.26-10.32 1.30-10.25	Exhaustion Intention to leave
Opportunities to take family when stationed abroad	31%	4.50**	1.40-14.57	Exhaustion

*p < .05, **p < .01, ***p < .001

One issue regarding time was related to the work content (64% reported having too little time to do "actual" engineering work). Constant time pressures were reported by 51% of staff and this had been further increased by the project deadline being pulled forward by six months (56% reported this as a problem). The time pressures were increased by contractors having little experience and training in carrying out their work (52% reported this as a problem). The high workload (those reporting this a problem were almost four times more likely to feel tense) had a negative spill-over effect on the work-life balance: Those who experienced problems with fitting in family around working hours were almost four times more likely to want to leave the organisation and feel exhausted, and those having problems with fitting in social activities were almost four times more likely to feel tense and more than five times as likely to feel exhausted. In addition

to these problems, those who reported having difficulties combining travelling and home life were more than five times as likely to want to leave and almost five times more likely to feel exhausted. Further, related to the work-life balance issue was that those who reported a lack of opportunities to bring family when stationed abroad were almost five times as likely to feel exhausted in that they could not combine family and work responsibilities when working abroad for longer or shorter periods of time.

In addition, there appeared to be a culture which frowned upon leaving early or even on time. Taking breaks was not entirely acceptable. If employees did not work all the time or took time out from work to have lunch, they felt that others did not think they worked hard enough. Those who reported a lack of opportunity to take breaks during working hours were more than three times more likely to wish to leave the organisation.

Linked to the "time pathology" was a culture of meetings. Anyone could book a meeting through the open diary system on the Intranet without consulting the person in question. This added to a sense of not being in control. Many meetings were held with many participants. Meetings were perceived to be time-consuming. Those reporting much time spent in meetings as problematic were almost five times as likely to be dissatisfied with their jobs. Qualitative reports and discussions with the Steering Group indicated that the content of many meetings focused on checking that things were being done and reassuring each other that the work would be completed in time. A problem with the extensive meeting culture was that the more meetings that were held, the less time one had to prepare for meetings and the more meetings were needed.

Comparison to theory. As predicted by theory, employees reported working under high time pressures. However, this was made worse by a culture that required many meetings and reporting procedures across the organisation, leaving little

time for core tasks. The high time pressures of the job led to negative spill-over effects on activities and family responsibilities outside work, which may not be directly related to teamwork but rather the fact that the workforce consisted of professionals rather than unskilled workers.

4.4.3 Communication and Interpersonal Relations in Case Study A

Several cultural issues were reported in case study A regarding communication and interpersonal relations. These can be found in table 4.4.

Table 4.4: Communication and interpersonal relations in case study A

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Not enough information to complete the work	58%			
Use of company jargon	51%			
Office layout of grey modules	53%			

*p < .05

Another possible pathology was related to communication and interpersonal relations. The term "team" was used to cover all kinds of groups from "the Project Team" and "the Supervisory Team". This had implications for how people communicated with each other. Although it was indicated that members of supervisory teams worked closely together; other factors interfered in a destructive manner.

It appeared that in the organisation, the term "team" was used to refer to groups of people where this was not the case. Often teams in the smallest unit, the supervisory teams, were forced to compete with each other to meet their own targets and deadlines, and several accounts were given that when designing a small car, areas were fighting for space. This created a competitive culture resulting in teams regarding information as their property and as power, and only to be given reluctantly to other teams (not enough information to complete the work was reported to be problem by 58%). In some cases, the later that information was given to others, the greater the likelihood of reaching the team's

own deadlines. Combined with the time pressures, the team structure created a culture where the overall goal, designing a car, was lost in the environment of teams trying to protect themselves. This culture made it even more difficult to meet what was often perceived as unrealistic targets and deadlines. The overall lack of objectives appeared to reinforce insecurity and did not act as a "buffer" against the chaotic environment described above. It was reported that employees tried to cope with this insecurity by seeking security in their immediate teams - the supervisory teams - because this was the level where they could keep an overview. This reinforced the negative aspects of the relationships between teams; they did not have the energy to focus on the entity.

Another important aspect of communication was that of feedback on progress. This focused on what was *not* achieved regarding targets and deadlines, rather than focusing on positive aspects of achievement. This created demotivated engineers who were repeatedly told that, although they were working hard, they did not achieve enough. Eventually, this lead to experiences of "learned helplessness" – "Nothing I do will make us achieve the deadlines and targets set, so what's the use in trying?"

A third aspect of communication concerned the office layout. Teams were working in open plan offices with up to two hundred engineers in one room separated by tall office modules separating teams and lower modules to separate members of a team (reported as problematic by 53%). These were reported to be depressing and to isolate employees, decrease opportunities for support and prevent employees getting to know each other across teams. At the same time, some reported that it created a feeling of false security because people thought they were not heard when in fact they were. In addition, supervisors did not provide optimal support because they could not provide confidential support unless they booked a room; this discouraged employees from seeking support from supervisors. Further, within the organisation there was a high usage of

company jargon, which was reported a problem for 51% (those who reported this a problem were almost three times as likely to be dissatisfied with their jobs).

Comparison to theory. As predicted by theory, employees reported communication problems across teams. Teams were protecting their own task by building boundaries and withholding information. However, not predicted by theory were a number of additional problems such as the use of the word "team" and the physical working environment in terms of office layout that led to confusion and further lack of communication.

4.4.4 Reward System in Case Study A

Several problems with the pay and reward system were reported. These are illustrated below in table 4.5.

Table 4.5: Reward system in case study A

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Limited number of bonuses	59%			
Small bonuses	55%			
Consistency of pay across the world	75%			

*p < .05

First, employees from the UK were paid less than employees in some other countries (75% of the total sample reported this to be a problem). Employees from abroad were at the home country pay level when working in Britain, resulting in foreign engineers being paid much more to do the same job as UK employees. This naturally created feelings of resentment and was perceived to be unfair.

Second, the annual bonuses were seen as problematic. The bonuses were small (55% perceived this a problem) and only very few people received them (59% reported this to be problematic). Thus they were perceived to be inadequate in that they were rare and when awarded, small.

Comparison to theory. None of the above problems with the reward system were directly related to working in teams but rather to the organisational structure and culture. However, these issues are likely to have a negative impact on the team climate. The reward system of bonuses focused on individual performance rather than team performance.

4.4.5 Career Development and Promotion in Case Study A

Some issues were identified relating to career development and promotion. These are reported in table 4.6 below.

Table 4.6: Career Development and Promotion in case study A

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Incentives for promotion	59%			
Lack of recognition for staying in a job and doing a good job	52%			
Relevance of training	25%	3.67*	1.10-12.27	Intention to leave

*p <.05

There appeared not to be much incentive to be promoted (59% reported lack of incentives for promotion). Qualitative reports indicated that being promoted to supervisor meant higher workload, more responsibility and in some cases lower pay. In addition, an engineer at the highest pay level doing a fair amount of overtime could be paid more that a newly appointed supervisor because there was a policy that supervisors did not get paid for the first 20 hours of overtime per month. Further, it was perceived by 52% of employees that there was a pressure to move around in the organisation and get promoted; it was not sufficient to stay in one area and do a good job there. Another issue related to career development was that employees reporting lack of relevant training were almost four times as likely to want to leave the organisation.

Comparison to theory. Case study A had implemented teams with a supervisory structure and therefore the issues regarding horizontal career progression were not

relevant; the issues raised related to career progression tended to be associated with organisational inconsistency, as was the case with the reward system.

4.4.6 Positive Aspects in Case Study A

This section describes the positive aspects of the job. They are individual factors, not related to any cluster. The positive aspects of the job can be seen in table 4.7

Table 4.7: Positive aspects of work in case study A

Aspect of work	Percentage
Pride in producing a good quality car	55%
Financial support for further education	55%
Amount of support from team members	72%
Quality of support from team members	65%
Amount of support from supervisors	53%
Quality of support from supervisors	55%

Engineers reported pride in producing a good quality car. Pride in producing a good quality car may reflect job involvement and commitment, which are expected outcomes of teamwork. Although financial support for further education was reported as a positive aspect of work, it was indicated in the interviews that even if the financial support was present, getting time off work to study and finding a work/life balance was problematic. Especially, many of the older engineers experienced problems in that they felt a stronger need for further education in order to get promoted. This led to feelings of being trapped. Other positive aspects of the job were the support from colleagues and from supervisors. Social support has been hypothesised to be one of the positive aspects of working in teams and thus this hypothesis is supported here. This will be further investigated in chapter 6.

4.4.7 Summary

In case study A, psychosocial hazards were found to be related to the way work was organised and managed. It was reported that management was unable to set

an appropriate performance framework for teams, and subsequently roles and responsibilities were not clear to engineers. Related to this were high time pressures, which were associated with problems finding a work/life balance. Communication was problematic across teams, with teams trying to protect themselves by not sharing information with other teams. Finally, the reward system was perceived to be unfair and not set up to support team performance but, rather, to reward individual excellence. Engineers also experienced problems progressing within the company without a degree. Although some of these issues can be related to teams, there is no reason to assume that teamwork brings about all the issues reported here: they could be part of any organisation and related to the roles of the professional regardless of whether they are working in teams or not. Positive aspects of the job were related to support from colleagues and supervisors, financial support for further education and pride in designing a high quality product.

4.5 Psychosocial Hazards in Case Study B

This section outlines the psychosocial hazards identified in case study B where employees were working in SMWTs. In tables 4.8-4.12, the frequencies and ORs are reported for case study B. As with case study A, only significant findings are reported in the tables.

In case study B, six organisational pathologies were identified all of which were closely interrelated: management, time pressures, communication and interpersonal relations, control and influence and career development and promotion.

4.5.1 Management in Case Study B

As in case study A, a number of issues were found to relate to the management culture. See table 4.8.

Table 4.8: Management in case study B

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Amount of monitoring of your workload by leaders/coaches	34%	4.05*** 3.01**	1.94-8.47 1.31-6.89	Exhaustion Job satisfaction
Prioritisation and planning of tasks by your coach/leader	47%	3.05*** 3.96***	1.54-6.04 1.63-9.61	Exhaustion Job satisfaction
Recognition from your coach for completing core/billable tasks	40%	1.98*	1.01-3.91	Exhaustion
Appreciation of your efforts by your organisation	47%	4.21***	1.73-10.25	Job satisfaction
Quality of direction from your coach	35%	6.21*** 7.65***	2.88-13.38 3.10-18.90	Exhaustion Job satisfaction
Clarity of management vision and objectives	62%			
Stability of management long-term vision	62%			
Accessibility of your coach	31%	5.73*** 2.70*	2.58-12.72 1.19-6.12	Exhaustion Job satisfaction
Approachability of the management	32%	2.58**	1.24-5.37	Exhaustion
Communication and support from coaches	50%			
Integrity of the statements and actions of the leadership team	50%			
Amount of trust you have in your leaders	46%	4.15***	1.71-10.07	Job satisfaction
Amount of trust you perceive your leaders have in you	34%	2.43* 4.80***	1.20-4.92 2.06-11.19	Exhaustion Job satisfaction
Clarity of signals and expectations from leaders about acceptable working hours and practices	47%	1.98*	1.01-3.87	Exhaustion
Number of initiatives that lead to change at work	52%	3.64*** 6.20***	1.82-7.29 2.23-17.30	Exhaustion Job satisfaction
Communication of reasons for introducing such changes	46%	3.51***	1.76-7.03	Exhaustion
Clarity of your own roles and responsibilities	31%	2.84** 2.88*	1.37-5.88 1.26-6.53	Exhaustion Job satisfaction
Coaches/leaders' expectations of you to work additional hours	26%	3.21** 4.53***	1.49-6.91 1.95-10.49	Exhaustion Job satisfaction
Level of concern from leaders towards staff well-being	45%	2.27* 3.02**	1.16-4.43 1.30-7.00	Exhaustion Job satisfaction
Level of concern from coaches towards staff well-being	34%	2.82** 2.76*	1.38-5.74 1.22-6.24	Exhaustion Job satisfaction

*p < .05, **p < .01, ***p < .001

First, as in case study A, a pathology seemed to be associated with the management culture. Case study B was an organisation continually striving for development. Initiatives were continually implemented that led to changes at work (this was perceived to be a problem by 52% and this had a severe impact on job satisfaction and exhaustion in those affected). It was perceived that management lacked a clear vision (perceived by 62%), stability in a long-term vision (62%) and that statements and actions of management lacked integrity (50% perceived this to be a problem). Also when such changes were implemented these were not clearly communicated to SMWTs. This was reflected in the lack of clear roles and responsibilities (those reporting this a problem were almost three times more likely to feel exhausted and be dissatisfied with their jobs). It was reported that it had not been clearly communicated to each SMWT what their primary task was, nor were tasks clearly allocated amongst teams. This meant that when a new assignment came in this tended to go, not necessarily to the most appropriate person for the job, but to the person on whose desk the task initially landed. The high amount of changes in the organisation combined with a lack of clear framework was further impaired by a lack of trust between management and employees and a perception that management was inapproachable with detrimental effects on employee well-being in terms of exhaustion and job dissatisfaction. In addition, it was felt that management did not appreciate employees' efforts (those reporting this to be a problem were more than four times as likely to be dissatisfied with their jobs compared to colleagues who did not see this as a problem).

Adding to these problems was a middle management that did not sufficiently support and communicate with employees (50% reported this as a problem). The same problems as with senior management concerning prioritisation and planning and quality of direction from coaches were found to be associated with job dissatisfaction and exhaustion. Those reporting their coach was not easily

accessible were more likely to be exhausted (almost six times) and dissatisfied with their jobs (almost three times). Further, those that did not feel recognised for completing their billable task were almost twice as likely to report being exhausted. And those reporting that the monitoring of their workload by their coaches was problematic were more likely to feel exhausted and be dissatisfied with their jobs.

In addition, a cluster of problems concerning how management and coaches dealt with employee well-being was identified. Those that did not feel managers and coaches were concerned with their well-being were more likely to be exhausted and dissatisfied with their jobs. Further, those who reported that the expectations of working additional hours were problematic were more likely to feel exhausted than those who reported no such problems.

Comparison to theory. As reported in case study A and predicted by theory, it was perceived that management was unable to provide clear roles and responsibilities. This was made worse by management making higher-level changes that employees were not informed about, but would nevertheless influence their work. In the organisation, the lack of clear roles and responsibilities meant that projects were allocated on a random basis rather than with those with an expertise. Further, the hypothesised problems with middle management were confirmed: they did not have the appropriate skills to support SMWTs and had difficulties functioning as the communication link between senior management and SMWTs.

4.5.2 Time Pressures in Case Study B

Also there were issues related to time in case study B. These are illustrated in table 4.9.

Table 4.9: Time pressures in case study B

Psychosocial factor	Frequency	OR	CI 95%	Outcome
High workload	57%	3.17** 3.87**	1.58-6.37 1.48-10.13	Exhaustion Job satisfaction
Number of tasks you have to do concurrently	53%	4.62*** 3.08**	2.28-9.34 1.27-7.45	Exhaustion Job satisfaction
Time spent dealing with unpredicted issues	62%	2.54**	1.26-5.15 1.31-10.20	Exhaustion Job satisfaction
Time available to complete core/billable tasks	46%	4.63*** 6.20***	2.28-9.40 2.35-16.34	Exhaustion Job satisfaction
Time available for additional/non-billable tasks	67%	2.09*	1.01-4.28	Exhaustion
Number of immediate demands from clients	45%	2.48** 3.72**	1.26-4.89 1.57-8.82	Exhaustion Job satisfaction
Number of requests for data from parts of the organisation	36%	2.20* 2.89**	1.10-4.43 1.28-6.55	Exhaustion Job satisfaction
Number of additional/non-billable tasks and roles you have	49%	3.01**	1.27-7.11	Job satisfaction
Number of non-essential meetings you have to attend	43%	2.41*	1.02-5.69	Job satisfaction
Impact of globalisation on your workload	37%	4.53***	1.94-10.59	Job satisfaction
Staffing levels in your team	58%	2.47**	1.24-4.92	Exhaustion
Length of your average working day	46%	2.26*	1.15-4.42	Exhaustion

*p < .05, **p < .01, ***p < .001

It was reported by a majority of staff that a high workload was a problem and this was related to reports of exhaustion and job dissatisfaction. The high workload was related to the lack of forward planning and prioritisation by managers. Also the lack of clear roles and responsibilities added to workload problems, as work seemed to "float" in the system and would be allocated on a random basis: team members reported that there was a "never saying no culture". This in addition had a negative impact on the working hours: employees reporting having a long working day were more than twice as likely to feel exhausted. This was felt to be

due to low staffing levels (58% reported this as a problem and it was related to exhaustion). The fact that the company consisted of two recently merged companies in the US and the Netherlands created problems in that team leaders could be situated on another continent and thus communication would be delayed (see section 3.1.6). Also it led to more work since there were different, sometimes conflicting, work practices and procedures on the two continents. The same was reported to be the problem with the many changes introduced. A range of problems were related to the content of the job. A lot of time would be spent on dealing with unpredicted issues and immediate demands from clients leaving the SMWT with little time to plan their work, further they would struggle with a number of non-billable tasks that they had taken over as it was not apparent who would be otherwise responsible: all this resulted in a number of tasks being required to be done at one time (issues related to increased exhaustion and job dissatisfaction). Other issues were reported in terms of a lot of time spent in meetings and that other parts of the organisation put forward immediate demands for information. All these issues lead to little time to engage in core tasks and this was related to increased exhaustion and job dissatisfaction.

Comparison to theory. As predicted by current theory on working conditions in SMWTs, the lack of clear roles and responsibilities was problematic because time pressures increased when time was spent dealing with issues not directly related to the core task. This was reported to be a bigger problem for employees than dealing with deadlines. Not directly related to SMWTs were problems with working across time zones in "virtual" teams and, as with case study A, with the meeting culture.

4.5.3 Communication and Interpersonal Relations in Case Study B

Another organisational pathology in case study B was concerned with communication and interpersonal relations. The results are outlined in table 4.10.

Table 4.10: Communication and interpersonal relations in case study B

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Availability of information to enable you to prioritise tasks	42%	2.50** 3.50**	1.27-4.94 1.50-8.15	Exhaustion Job satisfaction
Awareness of organisational structures and roles	38%	2.29** 2.71*	1.14-4.57 1.20-6.13	Exhaustion Job satisfaction
Recognition of the local context to your work	20%	2.92*	1.17-7.30	Job satisfaction
Regularity of team meetings	18%	3.18* 2.94*	1.23-8.22 1.19-7.31	Exhaustion Job satisfaction
Communication between the US and the Netherlands	51%			
Knowledge of other people's roles and responsibilities	44%	2.31* 2.77*	1.18-4.52 1.21-6.33	Exhaustion Job satisfaction
Others' respect for your work patterns	17%	2.70*	1.06-6.86	Job satisfaction
Conflicting/overlapping priorities of teams and departments	55%	2.77** 5.60***	1.40-5.48 2.01-15.92	Exhaustion Job satisfaction
Appreciation of different work practices in different countries	20%	2.56*	1.05-6.32	Job satisfaction
Reliability of computer systems on servers	55%			
Workability of open plan offices	33%	2.47*	1.10-5.58	Job satisfaction

*p < .05, **p < .01, ***p < .001

A number of issues were identified regarding communication and interpersonal relations. Within teams it was perceived a problem that the communication was limited and irregular. This was a problem at two levels. Due to the merger of the two companies in the Netherlands and the US, some SMWTs had members in two countries and this made communication difficult (51% reported this problematic).

Computer servers were reported to be unreliable by 55% of the population, which made it even more difficult to communicate electronically. This and the fact that the job required much business travel to start and monitor projects around the world meant that teams did not meet on a regular basis and made it difficult for teams to develop a team identity: these issues were associated with job dissatisfaction and exhaustion. Qualitative accounts related to the cultural differences included a lack of respect of work patterns. Those experiencing this as a problem were almost three times as dissatisfied with their jobs as those who did not report such problems and those who felt that cultural differences in work practices were not appreciated were almost three times as likely to be dissatisfied with their jobs.

Further, it was perceived that working in the open plan offices was problematic. Whereas the problems in case study A with the open plan offices were reported to be concerned with lack of opportunities for communication, the opposite was the case in organisation B. Most open plan offices were relatively small, each hosting one team. The office modules separating individuals and, in larger rooms, teams, were low and gave little protection for others' talking to each other or talking on the phone. It was felt there was little opportunity for privacy for individuals, little opportunity to work in peace and quiet.

As with case study A, problems were identified across teams: those reporting that the local context – other teams – had little knowledge of your work were more dissatisfied with their jobs than those that did not see this as a problem. Further, it was a problem that individuals had limited knowledge of other people's role and responsibilities, as there were problems with tasks "floating" in the system. This meant that individuals would take on tasks for which they did not have time or for which they may not be qualified, simply because they were unable to identify a person more suitable for the job. This was also reflected in the conflicting/overlapping priorities of teams and departments. Both were found to

be associated with job dissatisfaction and exhaustion. The lack of information on roles and responsibilities were also present at the horizontal level, as employees did not feel they had the appropriate information to prioritise tasks. Nor were they aware of organisational roles and structures. These issues were associated with job dissatisfaction and exhaustion. All these led to poor relations between teams. As with case study A, some teams were trying to protect themselves and avoid having extra work put on them because some of their time was taken up by tasks that they should not be doing but did not know to whom to give it.

Comparison to theory. As predicted by theory and seen in case study A, there were problems with communication across teams. Again this was made worse by the unclear roles and responsibilities: there was little communication across teams and there was no clear structure of allocating tasks and projects across teams. As predicted by the "virtual" team structure, see section 3.1.6, problems were also reported with internal communication due to geographic distances, unstable communication means and time zones. In contrast to theory, the physical environment was found to be a problem as SMWTs had not been delegated the autonomy to change their physical environment to fit their needs.

4.5.4 Decision Latitude and Control in Case Study B

In table 4.11, a number of issues relating to decision latitude and control are described.

Table 4.11: Decision latitude and control in case study B

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Influence of scorecards on your departmental work priorities	43%	3.29**	1.41-7.65	Job satisfaction
Influence of scorecards on individual behaviour	38%	5.51***	2.30-13.19	Job satisfaction
Amount of control you have over your attendance at meetings	40%	2.27*	1.01-5.10	Job satisfaction
Amount of control your team has over its operations	36%	2.98**	1.31-6.77	Job satisfaction
Amount of control you have over your work	39%	3.50**	1.52-8.05	Job satisfaction
Amount of consultation prior to the introduction of changes	60%	2.34* 3.16*	1.17-4.68 1.21-8.30	Exhaustion Job satisfaction
Amount of control you have over the implementation of changes	58%	6.19***	2.04-18.80	Job satisfaction

*p < .05, **p < .01, ***p < .001

Related to the management pathology were issues of control and influence. Employee felt they lacked control in a wide range of areas. First, the way scorecards controlled both the work of the individual and the team and the lack of control over incoming tasks were associated with job dissatisfaction. This was related to the perceived lack of management. As managers did not provide any clear direction, scorecards tended to take over the function of management in guiding teams in how they should prioritise and in which direction they were going. Further, meetings were reported a problem in that it was mandatory to attend many of these meetings, even if they were of little relevance to the individual. These issues were also associated with job dissatisfaction.

However, it was not only in the day-to-day work that employees felt they lacked control. They also felt they had little control over the changes made by management that influenced their work. They did not feel they were consulted before such changes. This was associated with both job dissatisfaction and

exhaustion. In addition, they felt that these changes were forced upon them (those reporting this a problem were more than six times as likely to be dissatisfied with their jobs).

Comparison to theory. The control and influence aspect was largely related to the organisational system of scorecards. Although employees were working in SMWTs and allegedly had a high degree of autonomy over their day-to-day work, the imposed changes of senior management meant that employees felt they had little influence over higher-level decision making. Thus this organisational pathology cannot be said to be related to teamwork per se. However, it raises questions as to whether the SMWT structure can easily be transferred from a manufacturing context to that of professionals.

4.4.5 Career Development and Promotion in Case Study B

As with case study A, a number of issues were related to career development and promotion. These are described below in table 4.12.

Table 4.12: Career development and promotion in case study B

Psychosocial factor	Frequency	OR	CI 95%	Outcome
Job security	22%	2.48*	1.19-5.15	Exhaustion
Effectiveness of the progression system	56%	2.79** 3.09**	1.39-5.61 1.23-7.78	Exhaustion Job satisfaction
Guidance and mentoring on career development for staff	57%	2.98*	1.19-7.46	Job satisfaction
Coaching and mentoring new staff	50%			
Guidance on training and development opportunities	53%	5.79***	2.08-16.11	Job satisfaction
Opportunities to progress whilst in the US	47%	2.58*	1.11-6.04	Job satisfaction

Career development was found to be problematic for a variety of reasons. Every four years, staff had to transfer to new jobs via an "open-resourcing" system where jobs were advertised internally and candidates employed in other parts of

the organisation would seek transfer. However, the system seemed to facilitate an environment following the principle of "a man for the job" i.e. that applicants were only successful in getting jobs where they already had the skills required for the job: this created anxiety for those with very specialised skills and meant that recruitment of staff with development and training needs was discouraged. In addition, the open-resourcing system meant that staff received little guidance on which jobs were suitable for them and where they could develop further skills. This was reported to be a problem especially in the US. Also new staff experienced problems with lack of coaching and mentoring.

Comparison to theory. It has been predicted by theory that the lack of vertical progression may be a psychosocial hazard for employees working in SMWTs. In case study B, it had been attempted to address this issue by implementing an open-resourcing system in order to facilitate and encourage the acquirement of skills horizontally. However, the problems reported in case study B indicated that the system did not function optimally.

4.5.6 Positive Aspects in Case study B

No positive aspects of the job were reported by the majority of staff in case study B. This may be due to the fact that SMWTs engaged in very different projects all over the world and therefore satisfactory aspects of the job could only be found at team level.

4.5.7 Summary

The management culture was found to be a problem in case study B. Again, it was reported that management found it challenging to set up a clear performance framework and they failed to communicate and implement changes in a structured and coherent way. Another organisational pathology was found to be that of time. High time pressures and poor prioritisation between tasks were related to exhaustion and dissatisfaction. Communication and interpersonal relations were

also found to be an organisational pathology, especially the fact that the SMWTs were situated in both the Netherlands and the US was seen to be causing problems. Career development and promotion was found to be another organisational pathology, in that the system was perceived to be inefficient and guidance and mentoring was lacking. Finally, the physical environment was found to be problematic.

4.6 Discussion

As described in the introduction, it has been hypothesised that working in teams may affect workload, time pressures, communication, the physical environment, autonomy, including individual autonomy, work content, interpersonal relationships, management, roles and responsibilities, career opportunities and job security. Although it was found that some organisational pathologies were related to teamwork, it became clear that not all these were necessarily related to teamwork per se but rather to the way work was organised, designed and managed within the organisation in a broader perspective.

In both case study A and B, problems were reported with management's lack of provision of a performance framework with clear roles and responsibilities and a communicated vision encompassing prioritised aims and objectives. However, this was reported to be not so much a result of teamwork as a result of management trying to navigate in a chaotic environment. The problems seemed to be similar in the two organisations, although more problems were reported in case study B. Thus it can be concluded that SMWTs may not protect employees from the detrimental effects of unstructured context – internally and externally. However, direct relations still need to be examined. Whilst in case study A employees reported support from managers and supervisors as a positive aspect of work, the opposite was the case in case study B. Here it was felt that managers took little interest staff well-being, coaches were not easily accessible and

management was perceived to be unapproachable. The two types of teamwork applied in the two organisations may explain this difference. In case study A, where Japanese style teams were applied, employees reported a positive relationship with management whereas as in case study B where employees were expected to be self-managing, it was felt that management showed little interest. Manz and Sims (1987) have emphasised the apparent contradiction in that SMWTs need managing (see chapter 7 for further exploration of the role of management in SMWTs). When cutting away several layers of middle management it is essential to ensure that a link between senior management and "shop floor" employees does not cease to exist.

As predicted, time pressures were high in both organisations. Many extra tasks were seen as problematic as a lot of reporting across teams was required in case study A. This could be a consequence of teamwork, as employees become multi-skilled and take on more tasks, they also become increasingly responsible for maintenance (less relevant in professional jobs) and for administration (this was reported to be a problem in both organisations). In case study B, the time pressures were made worse by the lack of knowledge of own and others' roles and responsibilities. Thus Ulich and Weber's (1996) suggestion that SMWTs may be better able to plan and schedule their work to manage high time pressures was not supported in this study. During interviews, one director reported that SMWTs could request having more staff employed. This is interesting as low staffing levels were related to exhaustion. A possible explanation could be that team members were not aware that they could make such requests. In both cases problems were experienced with long working days. In case study B, those reporting problems with a long working day were more likely to be exhausted whereas in case study A issues were raised regarding finding a work/life balance. These findings cannot necessarily be explained by teamwork as such but rather that professionals in general tend to have long working hours. For example, Cully

et al (1999) reported that 21% of professionals in Britain worked more than 48 hours a week.

Case study A reported a few problems with communication; teams did not have sufficient information to complete their task, the use of company jargon made communications difficult and the physical environment made it difficult to communicate across teams. Only the first issue can be said to be related to teamwork. Poor communication between teams has been predicted. However, in case study B, a number of problems were identified. The same problems were reported with regards to communication across teams. However, also problems within teams were reported. This was found mainly to be due to the issue of "virtual teams" (see section 3.1.6). SMWTs did not meet on a regular basis, which made it difficult to share information and develop a team identity. The fact that the SMWTs were located on the two continents, with consequent time-zone differences made communication difficult and there was little tolerance towards different working practices. This cannot be associated with teamwork per se but can rather be seen as a way *not* to implement teams, as it is difficult to ensure that teams in reality function as teams.

Interestingly, in case study B a number of problems were reported related to decision latitude and control. This is of interest because this was the organisation where SMWTs were present rather than just Japanese style teams with a lower degree of autonomy. However, employees in case study B reported having low levels of control over their work and felt that their autonomy was compromised by the scorecards. This may be due to the fact that although teams were self-managing, the organisational structure was designed in such a way that made it difficult for employees to control their own work and engage in higher-level decisions.

In case study A problems were related to the reward system: Bonuses were limited and small and given to individuals; this did not encourage team effort. Procter and Mueller (1999) have emphasised the importance of implementing a reward structure which rewards employees at the team level in order for team members not to work against each other. The element of competition was made worse by the fact that team members within the same team would be paid according to whether they were expatriates rather than which country they were working in.

In both case studies, an organisational pathology regarding career development and promotion was identified. In case study A, it was perceived that although the opportunities for promotion were present, there was little incentive for being promoted and it was more a problem to stay at the same level and be appreciated at that level than to get promoted. In case study B, where vertical progression was difficult due to the SMWT structure, horizontal career development was problematic as the system made it difficult to navigate between career opportunities and training.

In conclusion, a number of organisational pathologies were identified in the two case studies. However, it is not clear to which degree these can be said to be associated with teamwork or rather with the nature of today's professional organisation. In chapter 5, the relationship between working conditions, team interdependence as a measure of teamwork and employee well-being is examined.

5. Interdependence as a Moderator of Employee Well-Being

This chapter explores the moderating effects of team interdependence on the relationship between working conditions and employee well-being. The data used are from case study A. Well-being was measured in terms of job satisfaction, tension/anxiety and exhaustion. Analyses suggested that different psychosocial hazards were linked to specific types of employee well-being. Team interdependence was found to moderate only a limited number of psychosocial hazards, largely those regarding interpersonal relations with management and peers outside the team. It is argued that working in a team has a limited impact on employee well-being and when it does have an impact it buffers specific predictors.

5.1 Introduction

As mentioned in chapter 1, a defining characteristic of teamwork is that of team interdependence, both in terms of task and outcome interdependence. Task interdependence has been defined as the level or degree to which work flows from one member to another in a way that makes the receiving team member dependent on the member passing on his work (Brass, 1984; Kiggundu, 1983). Outcome interdependence on the other hand concerns whether team members believe that it facilitates or hinders their work when other team members complete theirs (van der Vegt et al, Emans & van de Vliert, 1998; Emans, Van der Vegt & Van de Vliert, 2000). This is related to the defining characteristic of purpose (see section 1.1); that team members are jointly responsible for completing the team task. Teams may be low in task interdependence but high in outcome interdependence. This may be the case in a call centre where workers take individual calls but are nevertheless jointly responsible for dealing with a certain number of calls per hour

and keeping customer waiting time at a certain level. Or vice versa, workers on the assembly line may be high in task interdependence but not mutually responsible for the overall product.

Team interdependence received a great deal of attention in the early job design literature, however, it has received less attention in recent years (Parker & Wall, 1998). Banker, Field, Schroeder and Sinha (1996) hypothesised that highly cohesive teams would have improved quality and productivity. Van der Vegt, Emans and van de Vliert (1998) hypothesised that interdependence plays an important role in organisational outcomes and in predicting team members' personal and work outcome and found that outcome interdependence was positively related to satisfaction and motivation whereas this was not the case for task interdependence. However, van der Vegt, Emans and van de Vliert (2001) later carried out a study in 148 employees in a technical consulting firm. They investigated the impact of task and outcome interdependence on job and team satisfaction and team and job commitment. This time they found that task interdependence was positively related to all outcome measures. In contrast, Campion, Papper and Medsker (1996) found that both task and outcome interdependence were closely related to job satisfaction. Thus there is controversy surrounding the degree to which the two forms of interdependence are related to positive well-being. Also, the question remains how team interdependence influences other, negative, aspects of employee well-being. This has been investigated in a few studies (Jackson, Sprigg & Parker, 2000; Sprigg, Jackson & Parker, 2000).

Jackson et al. (2000) examined teamwork in a UK rope manufacturing company. Two different groups were examined (a total sample of 266 employees): Wire teams and rope teams. The two teams had different working conditions: the rope-making teams' work was organised in such a way that team members were highly dependent on each other for carrying out the task and teams were organised

around producing a product, i.e. rope for fishing. In the wire-drawing teams there were no obvious advantages of working together and teams were organised around processes (grouping employees together who worked on similar sizes and sorts of machines). Comparisons between the two groups indicated that perceived working conditions differed in terms of increased autonomy and higher skill variety in rope-making teams. These teams also reported higher job satisfaction and lower strain than the wire-making teams with low interdependence. The findings supported the hypothesis that the design of teams affects employee well-being.

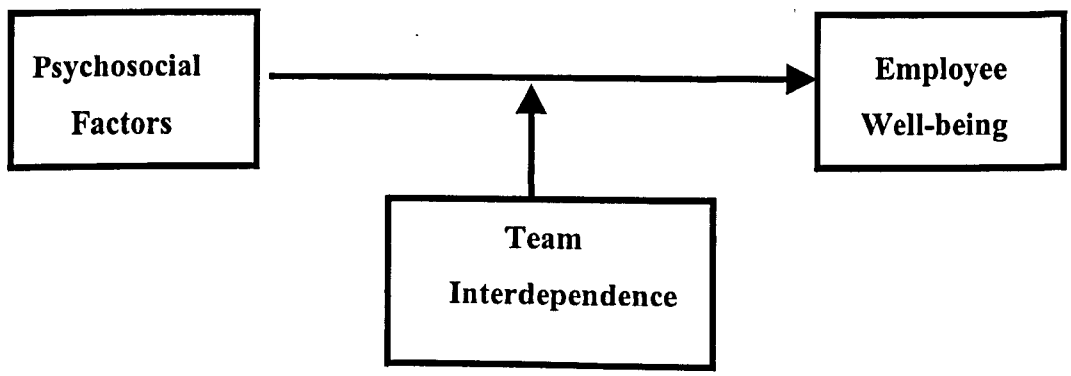
Further analyses of these data were carried out using multiple hierarchical analyses (Sprigg et al., 2000). It was found that interdependence was a strong predictor of both job-related strain and job satisfaction; teams with a low level of task interdependence experienced lower levels of satisfaction and higher levels of strain. Sprigg and her colleagues went on to investigate the moderating effects of team interdependence on the relationship between autonomy and employee well-being. They found that employees in teams with a high degree of team interdependence and autonomy were more satisfied that employees in the low-interdependent wire-making teams.

5.1.1 Aims of this Study

This chapter builds on to the research of van der Vegt et al (2001; 1998), Emans, van der Vegt and van de Vliert (2000), Jackson et al. (2000) and Sprigg et al. (2000). Rather than focusing on task and outcome interdependence as two separate constructs these two are combined as a measure of the degree to which an individual can be said to work in a team – the "quantity" of teamwork. It investigates the relationship between team interdependence and employee well-being and the possibility that team interdependence moderates the relationships between working conditions and employee well-being. As found in chapter 4 and

hypothesised by Levi (1981) different working conditions are related to diverging effects on employee well-being, therefore three measures of well-being have been applied; tension, exhaustion and job satisfaction. The outcome measures were selected on the basis that employees reported being more exhausted and dissatisfied with their jobs. Qualitative accounts reported that tension was high in teams even if this did not come out in the quantitative analyses. The proposed effect of team interdependence is described in figure 5.1.

Figure 5.1: Model for the moderating effect of team interdependence on employee well-being.



The two main research questions are:

1) Is team interdependence related to increased well-being?
2) Does interdependence moderate the relationship between working conditions and employee well-being, and if so, how?

5.2 Methods

To explore how team interdependence may moderate the relationship between working conditions and employee well-being, data from case study A were analysed using Pearson's correlations and multiple hierarchical regression analyses. The main method of analysis applied was that of multiple regression to

understand the antecedents of employee well-being in teamwork. There are a number of reasons for this. First, the main aim is to allow the accurate and valid prediction of changes in well-being related to changes in multiple independent variables. This is the objective of multiple regression (Tabachnik & Fidell, 1996). It also allows the calculation of the amount of variance in the dependent variable explained by the independent variables. Second, it is easier than many other methods to understand, interpret and use: Most researchers are familiar with the terms of regression. Third, multiple regression has the flexibility to cope with various multivariate models (such as moderator and mediator models). Finally, as seen above, it is a method that has been used previously to answer similar questions to those posed in this chapter. The measures used were those of single item working conditions, team interdependence, exhaustion, tension and job satisfaction. These are described in detail in section 3.2.

5.2.1 Analysis

Analyses were carried out using SPSS version 10 (SPSS, Chicago, IL). First, the means, standard deviations, and zero order correlations among team interdependence and outcome variables were calculated. For correlational analyses, Pearson's correlations test (2-tailed) was applied.

The moderating role of team interdependence on the psychosocial factors-employee well-being relationships were examined using hierarchical multiple regression analysis (Cohen & Cohen, 1983). Interaction effects were investigated by including both the main effects of working conditions and team interdependence and the cross-product term in the analysis. The test for an interaction effect is based on the variance explained by the cross-product term over and above that accounted for the main effects. Examination of the standard errors for skew and kurtosis for all measures of working conditions, team interdependence and well-being measures indicated all measures were normally distributed. An additional assumption to moderation is that it is desirable that the

moderator does not correlate neither with the predictor nor the criterion. That these are not correlated ensures a clearly interpretable interaction (Baron & Kenny, 1986, p. 1174). However, where correlation is present between the moderator variable and the predictor and criterion variables these should be weak or inconsistent.

5.2.2 Analysing at the Individual Level

Following the appraisal model, it is the individual's subjective appraisal of his or her working conditions, which are important when determining his or her reactions to these conditions. However, in order to confirm whether a team level analysis would have been appropriate, the difference between teams on team interdependence was investigated using one-way ANOVA comparing the means of teams against the other. The one-way ANOVA indicated that there was no significant difference between teams (F (56) = 1.39, p = .23). Therefore the individual level approach was confirmed and analysis was carried out at the individual level.

5.3 Results

Means, standard deviations and correlations of team interdependence and employee well-being measures are shown in tables 5.1a-e. Table 5.1a shows the overall correlations between team interdependence and the outcome variables. However, in order to investigate the assumption that team interdependence did not correlate strongly with the predictors, tables 5.1b-5.1e show the correlations between team interdependence and the predictors. To facilitate reading, the tables are divided according to criterion. Only predictors in significant moderation are reported and only in relation to the moderated criterion.

Table 5.1a: Correlations between team interdependence and employee well-being

	Mean	*SD*	1	2	3	4
1. Team interdependence	36.56	10.32	1.00			
2. Tension	7.15	6.24	-.12	1.00		
3. Exhaustion	18.68	8.17	-.10	.74**	1.00	
4. Job satisfaction	2.51	.07	.02	.15	.08	1.00

*p < .05 level, **p < .01 level

The first research hypothesis posed the question as to whether a high degree of team interdependence is related to improved employee well-being. This was investigated by using Pearson's correlation analysis. In table 1, the relationship between the degree of team interdependence and employee outcome variables is described. A negative correlation was found between team interdependence and exhaustion (r = -.31: p < .01). Thus, employees reporting a high degree of team interdependence reported feeling less exhausted. Team interdependence was not found to correlate with tension and job satisfaction.

Table 5.1b: Correlations between team interdependence, predictors and tension

	Mean	*SD*	1	2	3	4
1. Team interdependence	36.56	10.32	1.00			
2. Tension	7.15	6.24	-.12	1.00		
3. Manufacturing people located elsewhere	1.32	.82	-.04	.18	1.00	
4. Manufacturing plant located elsewhere	1.49	.75	-.01	.10	.57**	1.00
5. Opportunities to make decisions about my work	1.72	.67	.17	.08	.33**	.18

**p < .01 level

As can be seen in table 5.1b, team interdependence did not correlate with neither tension nor with any of predictors.

Table 5.1c: Correlations between team interdependence, predictors and job satisfaction

	Mean	*SD*	1	2	3	4	5	6	7	8
1. Team interdependence	36.56	10.32	1.00							
2. Job satisfaction	2.51	.07	.02	1.00						
3. Opportunities to engage in a variety of tasks	2.20	.75	.02	-.03	1.00					
4. Opportunities to make decisions about my work	1.72	.67	.17	-.09	.29*	1.00				
5. Opportunities of supervisors to make decisions during the working day	1.54	.81	.10	-.19	.02	.31**	1.00			
6. A lot of overtime	1.88	.76	.02	.06	-.22	-.15	-.09	1.00		
7. Unpaid overtime	.91	1.01	.00	.15	.18	.07	.20	-.03	1.00	
8. Financial support for further education	2.34	.92	-.01	.25*	.08	-.14	.19	.02	.18	1.00
9. Quality of support from team members	2.59	.60	-.05	.08	.25*	.16	-.02	-.01	.-.03	-.04

*p < .05 level, **p < .01 level

As can be seen in table 5.1c team interdependence was not related to any predictors in relation to job satisfaction nor was is related to the job satisfaction measure in itself.

5.1d: Correlations between team interdependence, predictors and exhaustion

	Mean	*SD*	1	2	3	4	5	6	7	8	9
1. Team interdependence	36.56	10.32	1.00								
2. Exhaustion	7.15	6.24	-.10	1.00							
3. Quality of support from management	2.59	.60	-.04	-.10	1.00						
4. Prioritising between objectives	.147	.62	.15	-.02	-.13	1.00					
5. Opportunities of supervisors to make decisions during the working day	1.54	.81	.10	.06	.09	-.06	1.00				
6. Managers' use of experience from engineers and previous programmes	1.69	.77	-.06	-.02	.10	-.05	.04	1.00			
7. Amount of feedback from other areas	1.77	.58	.10	-.12	.24	.00	.29*	.05	1.00		
8. Format and content of feedback from other areas	1.81	.53	.07	-.28*	.30*	-.04	.23	.10	.64**	1.00	
9. Support from colleagues about home responsibilities	2.06	.77	-.21	.22	-.20	.09	-.12	-.07	-.14	-.17	1.00
10. Responsibility for the work of contractors	1.19	.85	-.01	.01	.22	.08	.17	-.03	.22	.28*	-.09

*p < .05 level, **p < .01 level

In table 5.1d, it can be seen that team interdependence did not correlate with any of the predictors.

Table 5.1e: Correlations between team interdependence, predictors and exhaustion

	Mean	*SD*	1	2	3	4	5	6	7	8
1. Team interdependence	36.56	10.32	1.00							
2. Exhaustion	7.15	6.24	-.10	1.00						
3. Unstable computers	1.70	.72	.08	-.03	1.00					
4. Time spent in meetings	1.56	.77	-.01	-.10	-.02	1.00				
5. Little time available for "actual engineering work"	1.28	.57	.20	.03	.15	.09	1.00			
6. Opportunities to make decisions regarding my work	1.72	.67	.17	.15	-.02	.18	.21	1.00		
7. Opportunities to engage in a variety of tasks	2.20	.75	.02	.09	.29*	.12	-.03	.29*	1.00	
8. Consistency of pay across the world	1.23	.50	.09	-.24	.14	-.09	-.12	.15	.30*	1.00
9. Limited number of bonuses	1.34	.82	.16	.01	-.14	.09	.34**	.21	.13	28*

*p < .05 level, **p < .01 level

In table 5.1.e it can be seen that team interdependence did not correlate with any of the predictors.

In order to test the hypothesis that team interdependence moderates the relationship between working conditions and employee well-being, hierarchical regression analyses were carried out. In tables 5.2, 5.3 and 5.4 the significant moderating effects of team interdependence on the three outcome variables are listed.

Tension

Table 5.2 shows the results of hierarchical multiple regression analysis examining the moderating role of team interdependence in the psychosocial factors- tension relationships. Three significant interactions were found, as indicated by significant ΔR^2 with the addition of the cross-product term. In the prediction of tension, manufacturing people located elsewhere and team interdependence interacted significantly ($\Delta R^2 = .07$; F (3,55) = 4.45, $p < .05$), so did team interdependence with manufacturing plant located elsewhere ($\Delta R^2 = .07$; F (3,54) = 4.02, $p < .05$) and opportunities to make decisions about my work ($\Delta R^2 = .10$; F (3,55) = 6.42, $p < .05$).

Table 5.2: Hierarchical regression analyses results for psychosocial factors as predictor and tension and criterion variable and team interdependence as moderator

	Tension change		
Step and variable	β	ΔR^2	F for ΔR^2
Step 1: Main effects		.05	1.59
Manufacturing people located elsewhere	.20		
Team interdependence	-.12		
Step 2: Interaction		.07*	4.45
Manufacturing people located elsewhere X Team interdependence	-1.29*		
Step 1: Main effects		.03	.73
Manufacturing plant located elsewhere	.11		
Team interdependence	-.13		
Step 2: Interaction		.07*	4.02
Manufacturing plant located elsewhere X Team interdependence	-1.19*		
Step 1: Main effects		.04	1.01
Opportunities to make decisions about my work	.15		
Team interdependence	-.12		
Step 2: Interaction		.10*	6.42
Opportunities to make decisions about my work X Team interdependence	-1.93*		

$p < .05$; **$p < .01$

Job satisfaction

In table 5.3a and 5.3b, the significant results of the moderating effects of team interdependence on job satisfaction were found to be related to issues surrounding opportunities to engage in a variety of tasks ($\Delta R^2 = .07$; F (3,56) = 4.00, $p < .05$), opportunities to make decisions about my work ($\Delta R^2 = .15$; F (3,58) = 10.72, $p < .01$), supervisors' opportunities to make decisions regarding their work ($\Delta R^2 = .09$; F (3,58) = 5.77, $p < .05$) and a lot of overtime ($\Delta R^2 = .07$; F (3,58) = 4.18, $p < .05$). These results are shown in table 5.3a.

Table 5.3a: Hierarchical regression analyses results for psychosocial factors as predictor, job satisfaction as criterion variable and team interdependence as moderator

	Job satisfaction change		
Step and variable	β	ΔR^2	F for ΔR^2
Step 1: Main effects		.00	.01
Opportunities to engage in a variety of tasks	.01		
Team interdependence	.01		
Step 2: Interaction		.07*	4.00
Opportunities to engage in a variety of tasks X Team interdependence	1.12*		
Step 1: Main effects		.01	.34
Opportunities to make decisions about my work	-.11		
Team interdependence	.04		
Step 2: Interaction		.15**	10.72
Opportunities to make decisions about my work X Team interdependence	1.87**		
Step 1: Main effects		.03	1.02
Opportunities of supervisors to make decisions during the working day	-.18		
Team interdependence	.04		
Step 2: Interaction		.09*	5.77
Opportunities of supervisors to make decisions during the working day X Team interdependence	2.09*		
Step 1: Main effects		.00	.13
A lot of overtime	.06		
Team interdependence	.02		
Step 2: Interaction		.07*	4.18
A lot of overtime X Team interdependence	-1.55*		

* p < .05; **p < .01; ***p <.001

In table 5.3b, the second part of the moderating effects of team interdependence on the relationship between specific working conditions and job satisfaction are reported. The working conditions moderated were: unpaid overtime (ΔR^2 = .06; F (3,58) = 4.00, p < .05) and financial support for further education (ΔR^2 = .08; F (3,58) = 4.94, p < .05). Finally, team interdependence was also found to moderate the effects of quality of support from team members on job satisfaction (ΔR^2 = .08; F (3,58) = 4.71, p < .05).

Table 5.3b: Hierarchical regression analyses results for psychosocial factors as predictor, job satisfaction as criterion and team interdependence as moderator

	Job satisfaction change		
Step and variable	*ß*	ΔR^2	*F for* ΔR^2
Step 1: Main effects		.03	.88
Unpaid overtime	.17		
Team interdependence	.02		
Step 2: Interaction		.06*	4.00
Unpaid overtime X Team interdependence	1.27*		
Step 1: Main effects		.06	2.17
Financial support for further education	.27*		
Team interdependence	-.02		
Step 2: Interaction		.08*	4.94
Financial support for further education X Team interdependence	-1.87*		
Step 1: Main effects		.01	.23
Quality of support from team members	.09		
Team interdependence	.02		
Step 2: Interaction		.08*	4.71
Quality of support from team members X Team interdependence	1.63*		

* $p < .05$

Exhaustion

The results of the multiple hierarchical analyses indicated that team interdependence moderated the effects of a range of working conditions on exhaustion. The significant results of these analyses are reported in table 5.4a, 5.4b, 5.4c and 5.4.d. As can be seen in the first table, significant interactions were found, as indicated by a significant ΔR^2 with the addition of the cross-product term concerning factors regarding management. Specific items were: quality of support from management ($\Delta R^2 = .07$; F (3,55) = 4.40, $p < .05$), prioritising between objectives ($\Delta R^2 = .09$; F (3,52) = 5.27, $p < .05$), opportunities for supervisors to make decisions during the working day ($\Delta R^2 = .10$; F (3,56) = 6.11, $p < .05$) and managers' use of experience from engineers and previous programmes ($\Delta R^2 = .16$; $F(3,53) = 10.18, p < .01$).

Table 5.4a: Hierarchical regression analyses results for psychosocial factors as predictor, exhaustion as criterion and team interdependence as moderator

		Exhaustion change	
Step and variable	*ß*	ΔR^2	*F for* ΔR^2
Step 1: Main effects		.02	.50
Quality of support from management	-.09		
Team interdependence	-.10		
Step 2: Interaction		.07*	4.40
Quality of support from management X Team interdependence	-1.83*		
Step 1: Main effects		.00	.07
Prioritising between objectives	-.05		
Team interdependence	.00		
Step 2: Interaction		.09*	5.27
Prioritising between objectives X Team interdependence	1.93*		
Step 1: Main effects		.03	.74
Opportunities of supervisors to make decision during the working day	.13		
Team interdependence	-.11		
Step 2: Interaction		.10*	6.11
Opportunities of supervisors to make decision during the working day X Team interdependence	-2.14*		
Step 1: Main effects		.00	.01
Managers' use of experience from engineers and previous programmes	-.01		
Team interdependence	-.01		
Step 2: Interaction		.16**	10.18
Managers' use of experience from engineers and previous programmes X Team interdependence	-2.31**		

* p < .05; **p < .01

As can be seen in the table 5.4b, another set of psychosocial factors surrounded the relationship to colleagues. Specifically, these concerned: amount of feedback from other areas (ΔR^2 = .15; F (3,53) = 9.71, p < .01), format and content of feedback from other areas, (ΔR^2 = .15; F (3,53) = 10.32, p < .01) support from colleagues about home responsibilities (ΔR^2 = .23; F (3,56) = 18.29, p < .001) and finally, responsibility for the work of contractors (ΔR^2 = .08; F (3,52) = 4.27, p < .05).

Table 5.4b: Hierarchical regression analyses results for psychosocial factors as predictor, exhaustion as criterion variable and team interdependence as moderator

		Exhaustion change	
Step and variable	β	ΔR^2	F for ΔR^2
Step 1: Main effects		.05	1.29
Amount of feedback from other areas	-.21		
Team interdependence	.01		
Step 2: Interaction		15**	9.71
Amount of feedback from other areas X Team interdependence	-2.94**		
Step 1: Main effects		.10	3.04
Format and content of feedback from other areas	-.32*		
Team interdependence			
Step 2: Interaction	.01	.15**	10.32
Format and content of feedback from other areas X Team interdependence	-2.80**		
Step 1: Main effects		.05	1.55
Support from colleagues about home responsibilities	.21		
Team interdependence	-.05		
Step 2: Interaction		.23***	18.29
Support from colleagues about home responsibilities X Team interdependence	2.51***		
Step 1: Main effects		.00	.02
Responsibility for the work of contractors	.02		
Team interdependence	-.03		
Step 2: Interaction		.08*	4.27
Responsibility for the work of contractors X Team interdependence	-1.57*		

* $p < .05$; ** $p < .01$; *** $p < .001$

Another set of significant interactions are reported below. These factors concerned: unstable computers ($\Delta R^2 = .11$; $F(3,53) = 6.37$, $p < .05$), time spent in meetings ($\Delta R^2 = .08$; $F(3,54) = 4.82$, $p < .05$) and little time available for "actual engineering work" ($\Delta R^2 = .13$; $F(3,55) = 8.40$, $p < .01$).

Table 5.4c: Hierarchical regression analyses results for psychosocial factors as predictors, exhaustion as criterion variable and team interdependence as moderator

		Exhaustion change	
Step and variable	*ß*	ΔR^2	*F for* ΔR^2
Step 1: Main effects		.01	.30
Unstable computers	-.11		
Team interdependence	.00		
Step 2: Interaction		.11*	6.37
Unstable computers X Team interdependence	-1.59*		
Step 1: Main effects		.02	.50
Time spent in meetings	-.10		
Team interdependence	-.10		
Step 2: Interaction		.08*	4.82
Time spent in meetings X Team interdependence	-1.17*		
Step 1: Main effects		.01	.35
Little time available for 'actual engineering work'	.04		
Team interdependence	-.11		
Step 2: Interaction		.13**	8.40
Little time available for 'actual engineering work' X Team interdependence	-2.08**		

$p < .05$; **$p < .01$

Finally, the last set of psychosocial factors, which in interaction with team interdependence affected exhaustion were: opportunities to make decisions regarding my work ($\Delta R^2 = .07$; $F\ (3,56) = 4.23$, $p < .05$), opportunities to engage in a variety of tasks ($\Delta R^2 = .09$; $F\ (3,54) = 5.34$, $p < .05$), consistency of pay across the world ($\Delta R^2 = .08$; $F\ (3,52) = 4.53$, $p < .05$) and finally limited number of bonuses ($\Delta R^2 = .07$; $F\ (3,53) = 4.23$, $p < .05$).

Table 5.4d: Hierarchical regression analyses results for psychosocial factors as predictors and exhaustion as criterion variable and team interdependence as moderator

		Exhaustion change	
Step and variable	β	ΔR^2	F for ΔR^2
Step 1: Main effects		.07	2.00
Opportunities to make decisions regarding my work	.24		
Team interdependence	-.14		
Step 2: Interaction		.07*	4.23
Opportunities to make decisions regarding my work X Team interdependence	-1.21*		
Step 1: Main effects		.01	.31
Opportunities to engage in a variety of tasks	.05		
Team interdependence	-.09		
Step 2: Interaction		.09*	5.34
Opportunities to engage in a variety of tasks X Team interdependence	-1.28*		
Step 1: Main effects		.05	1.49
Consistency of pay across the world	-.23		
Team interdependence	.01		
Step 2: Interaction		.08*	4.53
Consistency of pay across the world X Team interdependence	-1.66*		
Step 1: Main effects		.00	.04
Limited number of bonuses	-.01		
Team interdependence	-.01		
Step 2: Interaction		.07*	4.23
Limited number of bonuses X Team interdependence	-1.56*		

* $p < .05$

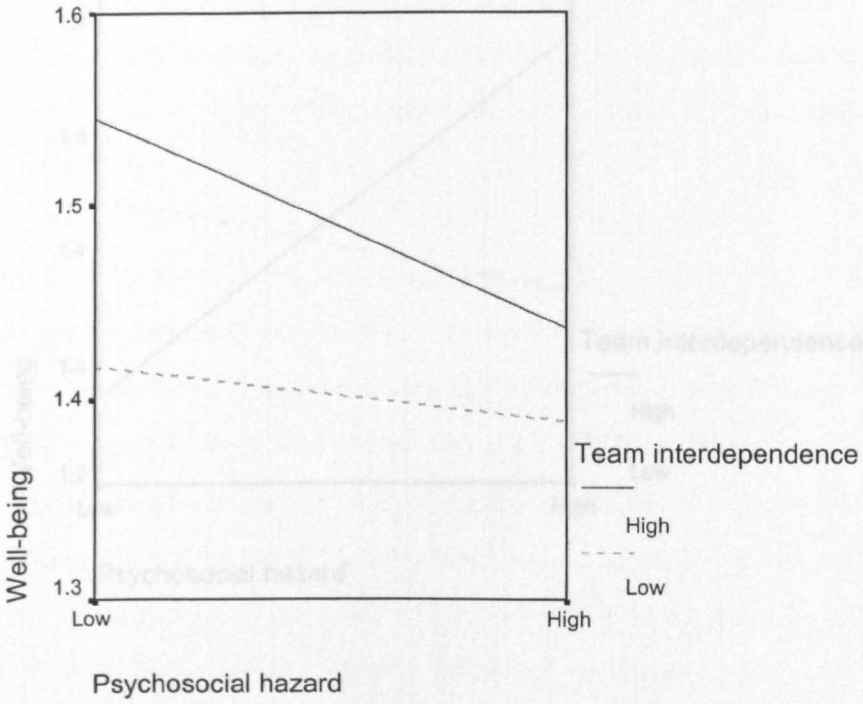
To summarise, two key clusters emerged: team interdependence moderated a number of issues surrounding management: amount of support from management, prioritising between objectives, opportunities for supervisors to make decisions during the working day and managers' use of experience from engineers and previous programmes. The second set of issues concerned the relationship with peers: Amount and feedback from other areas, format and content of feedback from other areas, support from colleagues about home responsibilities and responsibility for the work of contractors. Additionally, other working conditions

moderated by team interdependence were opportunities to make decisions regarding my work, opportunities to engage in a variety of tasks, consistency of pay across the world and limited number of bonuses, unstable computers, and time spent in meetings and little time available to do "engineering work".

Interaction effects

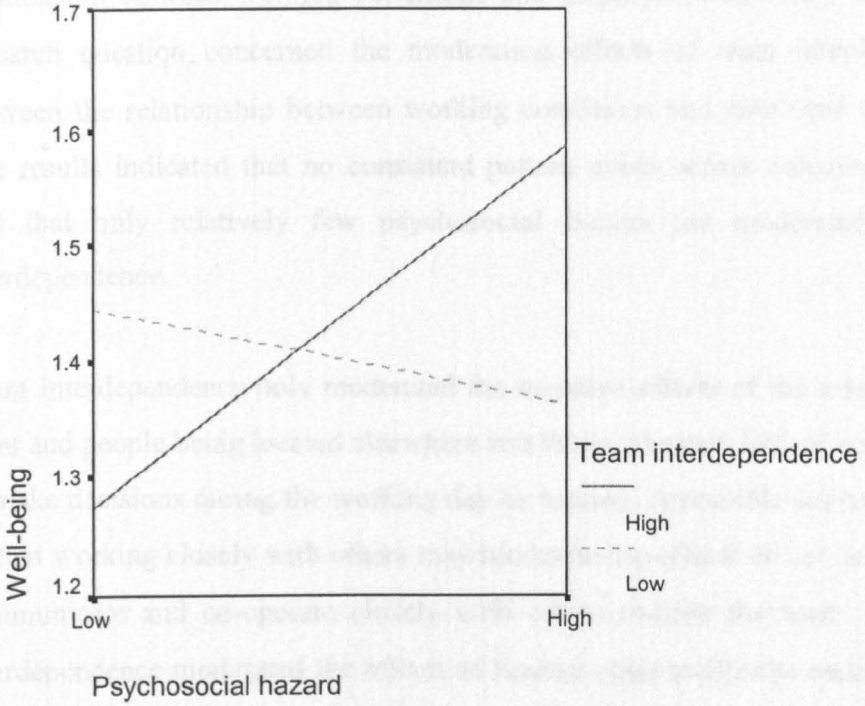
Figure 5.2a and 5.2b highlight the pattern of interaction effects of team interdependence. Graphs were produced for all factors; however, in order to illustrate the effect only two figures are included here. It is important to note that these figures merely represent an illustration of the effects rather than the precise effects; their function is to show the direction of the interaction effects. To facilitate reading of the models, exhaustion and tension were reversed so that a high score means high well-being, i.e. low levels of tension and exhaustion. Figure 5.2a shows that whilst those individuals who experienced a high degree of team interdependence and, at the same time, reported a working condition to be poor, experienced higher well-being than individuals who reported a low degree of team interdependence and, at the same time, reported a working condition as problematic. This means that a high degree of team interdependence buffered the negative effects of psychosocial hazards on well-being.

Figure 5.2a: Moderating effects of team interdependence on psychosocial factors and employee well-being



However, not all interactions followed the expected pattern. For job satisfaction, a lot of overtime and financial support for further education the relationship was the opposite. This was also the case for exhaustion, support from colleagues, support from colleagues about home responsibilities and finally lack of prioritising between objectives: reporting the working condition a problem combined with a high degree of team interdependence was associated with low well-being: low job satisfaction and a high level of exhaustion. This interaction is shown in figure 5.2b.

Figure 5.2b: Moderating effects of team interdependence on psychosocial factors and employee well-being



5.4 Discussion

Research hypothesis 1 proposed that the higher the degree of team interdependence the better general well-being. This hypothesis was only partially supported by the findings in this study. Only team interdependence and exhaustion were found to be directly correlated. This is contradictory to the findings of the study carried out by van der Vegt et al (2001, 1998), Campion et al (1996) and Sprigg et al. (2000) who found more supportive evidence of this hypothesis.

A possible explanation may be that if the surrounding system is not optimally organised in structures that support teamwork, the potential benefits of working in teams will not be activated. This conclusion was also reached by Sprigg et al. (2000) in the study of teams described above.

The current literature tells us little about how teamwork moderates the relationship between working conditions and employee well-being. The second research question concerned the moderating effects of team interdependence between the relationship between working conditions and employee well-being. The results indicated that no consistent pattern exists across outcome variables and that only relatively few psychosocial factors are moderated by team interdependence.

Team interdependence only moderated the negative effects of the manufacturing plant and people being located elsewhere and the employees' lack of opportunities to make decisions during the working day on tension. A possible explanation may be that working closely with others may moderate the effects of not being able to communicate and co-operate closely with others outside the team. That team interdependence moderated the effects of limited opportunities to make decisions during the working day on tension is interesting, as it has been hypothesised that teams may bring about limited individual autonomy. The fact that team interdependence moderated the negative impact of limited autonomy indicates that this was not found in this case study. It may be that if employees experience limited autonomy, being in a team minimises the negative impact of such limited autonomy on tension. In fact, opportunities to make decisions during your working day was the only variable which was significantly moderated by team interdependence on all outcome variables: tension, exhaustion and job satisfaction.

Team interdependence was found to moderate the relationship between unpaid overtime and job satisfaction. This may be because working late under unsatisfactory working conditions (unpaid) may be seen to be serving a purpose if employees are working late to help other colleagues and together reach a deadline. However, it was also found that employees reporting a lot of overtime and a high

level of team interdependence were less satisfied with their jobs than those with a lower degree of team interdependence. It may be that peer pressure plays a role in this relationship: In teams where members are highly dependent on each other, there is more of a pressure from colleagues to work overtime to complete the team's task.

Team interdependence moderated both the negative impact of lack of opportunity to engage in a variety of tasks and the lack of supervisors' to make decisions during the working day on both job satisfaction and exhaustion. The first may be due to the fact that if team members are highly dependent on each other, they are more likely to help each other out and therefore be acquainted with other team members' tasks. The latter may be explained by the fact that working as a close-knit unit may alleviate the problems arising when supervisors have to wait for management to make decisions. When responsibility is shared with others, the pressure placed on the individual is reduced: there may be a feeling of "we are all in the same boat".

When looking at the working conditions related to exhaustion, which were significantly moderated by team interdependence; two main clusters emerged. The first is related to management. As mentioned earlier, supervisors' limited opportunities to make decisions were moderated by team interdependence. But also the amount of support from management and managers' use of experience from engineers and previous programmes were moderated by team interdependence when the outcome variable was exhaustion. This indicates that working closely together and being responsible for the outcome buffers the negative effects of aspects of a poor management so that team members are less exhausted.

Another set of working conditions related to exhaustion that were buffered by a high degree of team interdependence concerned the relationship with peers.

Across teams and departments, team interdependence buffered the negative effects of a low amount of feedback from other areas and format, poor content of feedback from other areas, and a high degree of responsibility for contractors. The reason why issues regarding feedback and contractors are moderated by team interdependence may be again be the "we are all in the same boat" feeling.

Interestingly, low support from colleagues (also about home responsibilities) and a high degree of team interdependence was related to a high level of exhaustion. A possible explanation for this finding may be that those employees who are forced to work together and depend on each other but at the same time do not experience support from their colleagues are more exhausted than those who do not report a high level of team interdependence. Also, those that reported a lack of prioritising between objectives and high levels of team interdependence were more exhausted than those reporting a lesser degree of team interdependence. A possible explanation may be that when employees work in a team they may have more tasks between which they have to prioritise. If team interdependence is taken as a measure of the degree to which you work in a team, the combination of reporting a high degree of team interdependence with a lack of opportunity to prioritise between these tasks is related to more exhaustion than if the individual is less dependent on his or her colleagues and thus may have less tasks between which he or she has to prioritise.

Employees who experienced a high degree of team interdependence were less exhausted than those with a low degree of team interdependence and reported problems with unstable computers, time spent in meetings and little time available for engineering work, and consistency of pay across the world and limited number of bonuses.

It has been suggested that the main reason why working in teams buffers some of the negative effects of poor working conditions on employee well-being may be

due to the social support offered by colleagues (Firth-Cozens, 2000; 1998). This is supported by qualitative data in case study A: It was reported that teams with high team interdependence also experienced increased opportunities to seek support from team members: Teams reporting less team interdependence worked less closely together; thus team members did not have the same opportunities for seeking the support of team members. It is possible that a high degree of team interdependence within teams increases the opportunities to receive social support to relieve the stress aroused by not being able to communicate with management, peers and contractors (the latter may be mainly due to language and cultural differences as many suppliers were not English and some did not speak any English).

This has important implications for implementing teamwork as a means of improving employee well-being. It could be that a high degree of team interdependence is another way of improving employees' opportunities for obtaining social support and that this only is effective with a limited range of psychosocial hazards. However, as indicated by the results, the concepts of team interdependence and social support should not be confused: Those with a high degree of interdependence but a low degree of social support reported high levels of exhaustion. This indicates that introducing teams with a high degree of team interdependence may not be of such importance as indicated by Sprigg et al. (2000) who found that the higher the degree of interdependence, the higher employee well-being. They found that the degree of team interdependence was the most important influence on employee well-being. However, they did not explore the impact of interdependence to the same extent as in this chapter on other working conditions. Whilst this study explored a wider range of working conditions it supports the findings of Sprigg et al.: employees working in highly-interdependent teams who at the same time reported having few opportunities to make decisions during their working day were less tense, exhausted and more satisfied with their jobs than those with low degrees of team interdependence.

6. Team Climate and its Influence on Employee Well-Being

Following the examination of the moderating effects of team interdependence in chapter 5, the moderating effects of team climate as a measure of the *quality* of teamwork on the relationship between management support and employee well-being are examined in this chapter. To identify which aspects of team climate may prove to have an especially strong effect, team climate was divided into its four sub-components: vision, participative safety, task orientation and support for innovation. Results indicated that team climate acts as a buffer on the relationship between poor management support and well-being. The sub-components of team climate; participative safety (resembling informational social support) and team support for innovation had a particularly strong buffering effect. These findings are discussed in relation to the implications for the design, management and organisation of teams and the possible impact of an innovative climate on personal growth and development.

6.1 Introduction

In chapter 5 it was stated that employees experiencing a high degree of team interdependence reported higher well-being in relation to a number of working conditions than those with a low degree of team interdependence. However, this tells us little about *what* it is about working in a team that may account for these buffering effects. In order to investigate how team processes (i.e., how well a team works together) influence the relationship between psychosocial hazards and employee well-being, this chapter investigates the moderating effects of team climate on the relationship between working conditions and employee well-being.

Team climate and team interdependence are two related measures in that they measure aspects of teamwork. However, they measure two different aspects of teamwork: Team interdependence can be said to measure the team construct

whereas team climate measures the quality of teamwork (Kivimäki, Sutinen, Elovainio, Vahtera, Räsänen, Töyry, Ferrie & Firth-Cozens, 2001). Ideally, a moderate correlation should be found between the two measures indicating that they measure related but different constructs. Pearson's correlations test (2-tailed) was applied to explore the degree to which the two constructs are related. The results indicate that those reporting a high degree of team interdependence also experienced better team climate ($r = .27, p < .05$).

As in chapter 5, the input-process-output model is applied in this chapter to investigate the effects of team processes on employee well-being. Whilst the process factor has been investigated in these models mostly in terms of performance and in some cases, positive well-being (Cohen & Bailey, 1997), this chapter aims to understand the mechanisms by which input, process and output factors influence each other. Whilst team climate has been found to be linked to employee well-being (Carter & West, 1998), little has been done to investigate in detail which aspects of team climate may account for this relationship.

In order to validate and further explore the findings outlined in chapter 5 (that team interdependence buffered the negative effects of poor management support on exhaustion), the input variable chosen in this chapter is management support. This has been chosen over other factors, for example, the relationship across teams despite the fact that team interdependence was found to be a stronger buffer on these relationships in chapter 5. Management support has been used as the defining variable, over the relationship between colleagues across teams, as both current theory and research indicate that management support is the most important factor of social support (Winnubst & Schabracq, 1996). It is therefore interesting to explore the relationship between team processes and management support.

The process factor investigated in this study is that of team climate (Kivimäki & Elivainio, 1999; West, 1994). Team climate is defined as the set of norms and expectations that members hold regarding particular domains of activity,

and are reflected in the aggregated perceptions of members. West (1994; 1990) and Kivimäki and Elovainio (1999) defined the following four aspects of team climate:

- Vision: The degree to which the team has clear and realistic objectives.
- Participative safety: Team members work together in a participative non-threatening environment where they feel part of a unit and share information.
- Task orientation: A climate where team members commit to high standards of task outcome and address weaknesses ensuring continual improvement.
- Support for innovation: Team members co-operate to develop and apply new ideas.

Firth-Cozens (2000; 1998) hypothesised that social support in teams may buffer the negative impact of poor working conditions on employee well-being. House (1981) distinguished between four types of social support: Instrumental support (helping the person by conducting part or the whole of the task), emotional support (providing care, love and sympathy), appraisal support (positive feedback about performance), and, finally, informational support (emphasising the sharing of information). The team climate subscale of participative safety can be said to be closely related to that of social support due to the scale's resemblance to informational support (Schaefer, Coyne & Lazarus, 1982, House, 1981). Based on this assumption, it seems reasonable to assume that participative safety may be a stronger moderator on the relationship between management support and employee well-being than other aspects of team climate. A number of studies have previously indicated that social support is related to employee health and well-being in professionals (Winnubst & Schabracq, 1996). It has been discussed whether social support has a direct or a buffering effect: whether social support has beneficial effects on employee health and well-being under all circumstances regardless of the nature of work characteristics, or rather, buffers the impact of poor working conditions on employee health and well-being (Winnubst & Schabracq, 1996).

The output variables applied in this study are those of exhaustion and tension from the General Well-being Questionnaire (Cox, Thirlaway, Gotts & Cox, 1983) and the single item job satisfaction measure also applied in chapter 5. Whilst Firth-Cozens (1998) has hypothesised that the main benefit of working in teams is that of increased opportunities for social support from other team members, Seers, McGee, Serey and Graen (1983) found that social support only moderates specific stress outcomes. Therefore, the remaining two outcome variables are included as a control of the previous finding that the interaction effects were found on exhaustion only.

Hodson (1997) conducted a meta-analysis of the effects of social relations in the workplace based on published books describing ethnographic case studies on teamwork supplemented by a telephone survey of 371 workers in a Midwestern state in the US. He hypothesised that social relations constitute an important part of the climate in the workplace and thus, how employees perceive and react to other team members and management. Hodson found that solidarity among team members increased job satisfaction and that the more support employees experienced from team members, the less conflict they experienced with management. He concluded that solidarity was a precondition for good employee-management relations rather than a result of conflicts with management.

Smit and Schabracq (1998) carried out a study investigating the impact of team culture on employee health and team productivity. The study involved participants from six teams: three research and three manufacturing teams. In all, 61 of a total of 145 employees participated in the study. Smit and Schabracq defined team culture as the way that team members deals with problems and hypothesised that stress leading to poor performance and employee health occurred when a team was not able to cope with problems due to an inadequate team culture. They found support for this relationship and concluded that teams with a "healthy culture" performed better and had

positive employee health and team members were continually able to develop by welcoming new challenges.

Kivimäki et al. (2001) carried out a study in three Finnish hospitals investigating the influence of team climate on absence. They compared the absence in 447 physicians against a control group of 483 head nurses and ward sisters. They found that absence in physicians in hospitals was predicted to a higher degree by a problematic team climate than physicians' health, overload, and job control. Thus working in a well-functioning team was found to be more important for the level of absence, even than physician's health. This was true even for long-term absenteeism. It has been argued that long-term absence is a better predictor of employee health and well-being as short-term absence has been found to be associated with voluntary absenteeism.

Gonzalez-Roma, Peiro, Subirats and Manas (2000) investigated how well cognitive work team climates such as support, innovation, goal orientation and respect for rules predicted affective work team climates measured by team satisfaction and commitment in 33 health care teams (in all 456 participants). They found that that cognitive work team climate predicted team satisfaction and commitment.

It is apparent from the studies outlined above that some tenuous relationships between team climate and well-being have been found. However, Sonnentag (1996) criticised research in teamwork for the lack of demonstrating associations between aspects of team functioning and employee well-being. In order to understand how team processes influence well-being it is therefore not sufficient to study the consequences of teamwork but also look at the ways in which teamwork may influence performance and employee well-being. It is this extended requirement that this chapter aims to address.

To summarise the main hypotheses of this study are:

1) That team climate and its four subcomponents will be related to employee well-being in terms of exhaustion, tension and job satisfaction,
2) that the process factor, team climate, moderates the impact of management support on employee well-being,
3) and; finally, that some aspects of teamwork will have stronger moderating effects than others, i.e. participative safety due to its resemblance to social support.

6.2 Methods

For use in this chapter a two-item scale measuring management support (α = .82) was extracted in order to investigate the possible moderating effects of team climate on management support. As in chapter 5, the data analysed are from case study A. The other scales; tension, exhaustion, job satisfaction and team climate have been described in detail in section 3.2.

6.2.1 Analysis

Analyses were carried out using SPSS version 10 (SPSS, Chicago, IL). First, the means, standard deviations, and zero order correlations among the management support scales, team climate, the four aspects of team climate, exhaustion, tension and job satisfaction were calculated. For correlational analyses, Pearson's correlations test (2-tailed) was applied.

The second hypothesis that team climate moderates the effects of management support on employee well-being was investigated by conducting multiple hierarchical regression analyses (Cohen & Cohen, 1983). See section 5.2 for a justification for using multiple regression analysis. Interaction effects were investigated by including both the main effects of management support and team climate and the cross-product term in the analysis. The test for an

interaction effect is based on the variance explained by the cross-product term over and above that accounted for the main effects. In the first step of the regression analysis, management support and team climate were regressed onto outcome variables and in the second step the interaction term (multiplication of management support and team climate) and entered into model two.

In order to test for the third hypothesis that certain aspects of team climate will have a stronger buffering effect on employee well-being than others, separate analyses using the same method were applied to each of the four subcomponents.

6.2.1 Analysing Team Climate at the Individual Level

As is chapter 5, the analysis is carried out at the individual level. As before a one-way ANOVA was conducted to investigate the appropriateness of analysing at the individual level rather than the team level. The one-way ANOVA indicated that there was no significant difference between teams ($F(61) = .98$, $p = .45$). Therefore the individual level approach was confirmed.

6.3 Results

Means, standard deviations and zero-order correlations of team management support, team climate and the four aspects of team climate and exhaustion measures are shown in table 6.1.

Table 6.1: Correlations between team climate, team climate scales, social support and employee well-being

	Mean	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Team Climate	49.11	9.93	1.00								
2. Vision	14.55	3.06	.76**	1.00							
3. Participative Safety	15.04	3.77	.86**	.49**	1.00						
4. Task Orientation	10.54	2.74	.85**	.51**	.67**	1.00					
5. Support for Innovation	8.92	2.46	.83**	.52**	.62**	.68**	1.00				
6. Management Support	2.36	.72	.24	.33**	.12	.10	.23	1.00			
7. Exhaustion	18.68	8.17	-.13	-.09	-.08	-.12	-.25*	.03	1.00		
8. Tension	7.16	6.24	-.15	-.05	-.22	-.11	-.12	-.08	.74**	1.00	
9. Job satisfaction	2.51	.07	.46**	.44**	.31*	.48**	.36**	-.06	-.05	-.04	1.00

*p < .05 level

**p < .01 level

Results of the correlations test indicated that all sub scales of the TCI-short correlated highly with the overall measure of team climate (from $r = .76$ to $r = .86$, $p < .01$). Subscales correlated positively (from $r = .49$ to $r = .68$ ($p < .01$). However, only the subscale team support for innovation correlated with exhaustion ($r = -.25$, $p < .05$). Thus, those engineers reporting higher degrees of team support for being innovative in their jobs reported lower levels of exhaustion. Engineers reporting a high team vision also reported high levels of management support ($r = .33$, $p < .01$). Job satisfaction was found to correlate positively with all aspects of team climate, including the overall construct.

In order to test the hypothesis of team climate as a moderator on the relationship between management support and employee well-being hierarchical regression analyses were carried out. The moderating effects of team climate on exhaustion, tension and job satisfaction are listed, in table 6.2.

Table 6.2: Hierarchical regression analyses results for management as predictor and exhaustion, tension and job satisfaction as criterion variables and team climate as a moderator

	β	ΔR^2	F for ΔR^2
Exhaustion			
Step 1: Main effects		.01	.16
Management Support	.02		
Team Climate	.02		
Step 2: Interaction		.13**	8.89
Management Support* Team Climate	-1.46**		
Tension			
Step 1: Main effects		.01	.34
Management Support	. 05		
Team Climate	. 08		
Step 2: Interaction		.08*	5.35
Management Support* Team Climate	-1.16*		
Job satisfaction			
Step 1: Main effects		.21**	8.27
Management Support	.05		
Team Climate	.47***		
Step 2: Interaction		.00	.05
Management Support* Team Climate	-.11		

p < .05; **p < .01; ***p < .001

As can be seen in table 6.2, the negative impact of management support on exhaustion was found to be buffered by team climate (ΔR^2 = .13; $F(3,63)$ = 8.89, p < .001). Team climate also buffered the relationship between management and tension, however, the effects were not as strong (ΔR^2 = .08; $F(3,62) = 5.35, p < .05$). No effect was found for job satisfaction. (ΔR^2 = .00; $F(3,62) = .05, p > .05$.

The third hypothesis stated that the effects of team climate would be primarily accounted for by participative safety due to its resemblance to informational support. This was tested for by breaking team climate up into its four subcomponents and running regression analyses separately for each subscale. As the strongest effect of the overall team climate construct was found on

exhaustion, this is the only outcome variable analysed in this section. The findings can be found in table 6.3.

Table 6.3: Hierarchical regression analyses results for management as predictor and exhaustion as the criterion variable and aspects of team climate as a moderators

		Exhaustion change	
Step and variable	β	ΔR^2	F for ΔR^2
Step 1: Main effects		.01	.16
Management Support	.01		
Vision	-.07		
Step 2: Interaction		.04	2.46
Management Support X Vision	-.81		
Step 1: Main effects		.00	.13
Management Support	.03		
Participative Safety	-.06		
Step 2: Interaction		.13**	9.01
Management Support X Participative Safety	-1.46**		
Step 1: Main effects		.01	.34
Management Support	.02		
Task Orientation	-.10		
Step 2: Interaction		.06*	4.20
Management Support X Task Orientation	-1.02*		
Step 1: Main effects		.06	1.83
Management Support	-.02		
Support for Innovation	-.24		
Step 2: Interaction		.15***	11.53
Management Support X Support for Innovation	-1.50***		

* p < .05; **p < .01; ***p < .001

As hypothesised, participative safety acted as a strong moderator on the relationship between management support and exhaustion (ΔR^2 = .13; $F(3,62)$ = 9.01), p < .01), explaining 13% of the variance. Shared vision had no significant moderating effect on exhaustion (ΔR^2 = .04; $F(3,62)$ = 2.46, p > .05), whilst task orientation in the team had a small significant effect on exhaustion (ΔR^2 = .06; $F(3,62)$ = 4.20, p <.05). Team support for innovation was found to be highly significant (ΔR^2 = .15; $F(3,62)$ = 11.53, p < .001) explaining 15% of the variance.

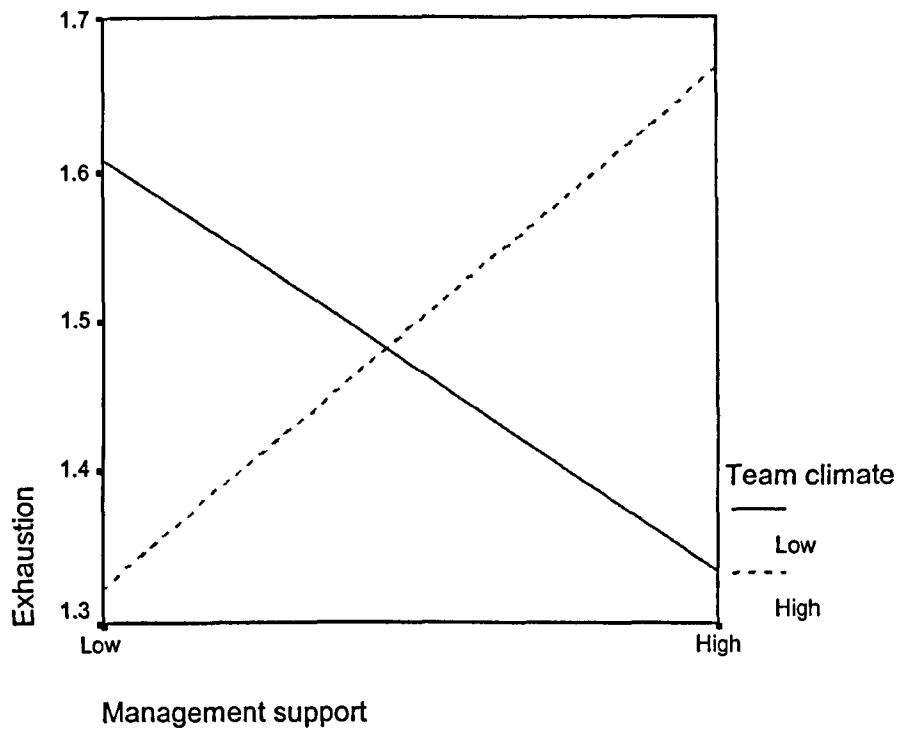
6.4 Discussion

Team climate was found to correlate highly with its sub-components. Interestingly, management support was highly related to the team vision. One possible explanation for this may be that managers play an important role in developing and conveying the vision to the team and act as the link between senior management and team members to provide a link between the overall organisational vision and the team's vision. Also of interest is the finding that team support for innovation was the only aspect of team climate that was found to be directly related to exhaustion. A direct relation between participative safety and exhaustion was not found. All aspects of team climate were highly correlated to job satisfaction - partly supporting previous claims that social support may have a direct impact on employee well-being.

The above findings support hypothesis 2 that team climate moderates the impact of management support on exhaustion.

Figure 6.1 shows the pattern of interaction effects of team climate. Those individuals experiencing a low degree of management support and good team climate were less likely to be exhausted than engineers experiencing poor management support, and at the same time, reporting a poor team climate. This relationship was also found for participative safety and team support for innovation.

Figure 6.1: Moderating effects of team climate on psychosocial factors and employee well-being



The third hypothesis was partly supported. It was found that participative safety was a strong moderator of the impact of management support on employee well-being explaining 13% of the variance, whilst a shared vision and task orientation had little or no buffering effect. These findings support Firth-Cozens' (2000) claim that one way of increasing the opportunities for social support may be to implement effective teamwork, in this case through the provision of informational social support.

Surprisingly, it was found that team support for innovation was an even stronger moderator of the impact that management support has on employee well-being explaining 15% of the variance. This is higher than that of participative safety.

The results indicate that a good team climate supporting innovation buffers the effects of poor management support on exhaustion. A possible explanation for this finding may be that teams take over the management function of supporting innovation. Management support for innovation has been found to be important for actual innovation (King, 1990, King & Anderson, 1990). It may be that in cases where management does not actively provide support, including support for innovation, team members take over this function and provide such support acting as a substitute for management.

Whilst it has been claimed by West and Farr (1990) that innovation brings about increased health and welfare in the broader population in areas such as medicine, education, science and psychology, this chapter suggests that innovation also brings about improved well-being at the micro-level in the people who work in an innovative climate. However, the results should be interpreted with great caution; it may be that support for innovation only plays a part in certain environments. Product development takes place in an uncertain and unpredictable environment where a high level of creativity and innovation is required. High demands are placed on employees to design a successful product. Success being defined as the degree to which car design is different from what has been seen before, whilst also meeting the demands of the environment in terms of high safety standards, low costs and high quality.

Broadbent (1987) and Nicholson and West (1988) have previously found that employees with opportunities to manipulate work environments and being creative were more satisfied and better adjusted than employees with lower levels of control. There are two possible explanations for these findings: First, working in an innovative climate may bring about opportunities for personal growth in that individuals engage in developing new ideas. Second, implementing such ideas may allow the team to change their working environment in such a way that it minimises the level of exhaustion. Teams should not only be implemented as one way of increased social support: benefits may also be achieved if teams and the context of their work are designed, organised and managed in a way that offers opportunities for

innovation and autonomy to implement such innovations. One such way of managing work may be to implement self-managing work teams. Such teams differ from ordinary teams, as described in the introduction in the increased degree of autonomy delegated to teams. It may be that team members who have a higher degree of autonomy experience freedom to be innovative in the way they organise themselves and how they carry out their task. The findings outlined in this chapter indicate that attention should be paid to management support for innovation in that they are encouraged to be innovative and have the resources made available for them to be innovative. This is investigated in chapter 7.

7. Opportunities for Learning and Innovation in Self-Managing Work Teams

Whilst previous chapters 5 and 6 focused on the working conditions and employee well-being in Japanese style teams, this chapter focuses on employee well-being in self-managing work teams (SMWTs). This is due to the hypothesis put forward in chapter 6 that the autonomy aspect of such teams may bring about increased opportunities for learning and innovation. To support the findings in chapter 5 that working in a team may have a buffering effect on the relationship between poor management and employee well-being, multiple hierarchical analyses were carried out investigating the moderating effects of the degree to which employees reported working in a self-managing work team on the relationship between management and employee well-being. The previous findings were confirmed; working in a team did indeed have a buffering effect. Further, it was found that employees who scored high on the SMWT scale reported more opportunities for learning and being innovative in their jobs. However, mediation analyses indicated that this relationship was mediated by a management that actively supported employees. It was also found that management mediated the relationship between opportunities for learning and innovation and employee well-being.

7.1 Introduction

Self-managing work teams (SMWTs) is a specific type of teamwork characterised by a high degree of autonomy being delegated to team members. Whereas chapter 5 and 6 focused on Japanese style teams, this chapter focuses on how employees may respond to working in this particular type of teamwork. In chapter 6, it was hypothesised that opportunities for innovation may play an important role in SMWTs due to the increased autonomy in such teams. Additionally, it was found that teamwork buffered the negative effects of poor management on well-

being in case study A. To support these findings, the current chapter extends this study to another population.

From an employee perspective, it is hypothesised that employees working in SMWTs will experience increased opportunities for learning and innovation in their jobs. Innovation has been termed the "industrial religion" of the late 20th century (The Economist, February 20th, 1999). There is an apparent dilemma in today's research on innovation in the workplace: On one hand it is recognised that too much structure and centralisation hinders innovation while on the other hand there needs to be a certain degree of centralisation and support to implement innovative ideas and procedures (West, 2000). It may be that teams offer a solution to this problem. While SMWTs provide a source for the development of ideas they can also provide an environment where implementation is supported both by other team members and by a management who ideally should be trained to encourage such self-management.

Agrell and Gustafson (1996) and Weber (2000) emphasised the importance of an autonomous work situation as an important condition for team members to explore ideas and be innovative. Indeed, it has been found that working in SMWTs may offer greater opportunities for team members to organise their work in a way that offers opportunities for learning and innovation than working with a lesser degree of autonomy (Steijn, 2000; Melin, Lundberg, Söderlund & Granqvist, 1999; Wall, Jackson & Davids, 1992; Jackson & Wall, 1991; King, 1990). Less attention has been paid to how working in SMWTs relate to employee well-being, in its positive as well as negative form. Much of the research that *has* investigated employee responses to working in SMWTs has focused on job satisfaction and organisational commitment (Yeatts & Hyten, 1998). These benefits are thought to come about via the increased use of employee skills, particularly those related to creativity and innovation (Moorhead, Neck & West, 1998; West & Farr, 1990). Much research on innovation in teams has primarily focused on how to create

innovative teams or the potential benefits in terms of improved performance (King, 1990). However, it has been claimed that opportunities to learn and apply new skills have a powerful impact on employee well-being (O'Brien, 1984;1983). For example, Nicholson and West (1988) found that increased opportunities for skill use were positively related to job satisfaction. And Warr (1990) found that utilisation of one's skills was strongly related to job satisfaction. Also the Whitehall studies showed that opportunities for learning new skills are important for mental health (Stansfield, Head & Marmot, 1998).

7.1.1 Innovation

Before proceeding to how learning and innovation may influence employee well-being in SMWTs, it is necessary to investigate the definition of innovation. Innovation has been defined as (Gard, 2000, p. 60):

> "The intentional process and application within a role, group, or organization of ideas, processes, products, or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group or the organization. Innovation is a social process."

A brief clarification of the difference between creativity and innovation is useful. These two terms have often been confused. West (2000, p. 2) has made the following distinction between the two concepts:

> "Creativity can be seen as the development of new ideas, while innovation is the application and implementation of those new ideas in practice."

Using this distinction makes it clear that creativity is more of a cognitive, individual activity whereas innovation concerns the implementation of ideas by groups, organisations or societies.

Innovation can be analysed at three levels, the individual, team and organisational level, at each level there will be factors facilitating and inhibiting innovation (Agrell & Gustafson, 1996).

Individual factors. Several personality traits have been identified in relation to innovation in teams. Some of the more common are creativity, desire for autonomy, social independence, high tolerance for ambiguity and a preference for taking risks: all of which have been found to have a positive impact on team innovation. However, individual factors have also been found to hinder innovation, e.g. employees being resistant to change and/or engaging in single-loop learning as described by Argyris (1990). Innovation is facilitated by team members exhibiting creativity, self-efficacy and cognitive abilities in support of creative production (West, 2000).

Team factors. Several factors concerning team composition have been found to facilitate innovation in teams: It is recommended that innovative teams have between 2 and 8 members. A team climate that supports innovation is important not only in terms of direct support for innovation (Anderson & West, 1994; West, 1990) but also in terms of: sharing visions and objectives as these should steer the direction of team innovation; participative safety where team members feel they can express themselves and their ideas without fear of ridicule and resistance; and a climate where the task is focused and provides standards against which innovation can be evaluated. Team factors that may inhibit innovation include adverse team processes such a social loafing (West, 2000), and the lack of will to engage in a democratic dialogue.

Organisational factors. Innovation in teams has been found to be facilitated by the degree of autonomy allocated to team members: if members experience discretion over their work they are more likely to develop and implement new ideas. Also leadership and management have been found to be powerful factors in determining the degree to which

teams are innovative. Further, teams that are rewarded for innovations are more likely to feel encouraged to develop and implement new ideas.

This chapter focuses on the impact of design and management of teamwork on learning and innovation and employee well-being.

Despite their autonomy, SMWTs do need managing – an apparent contradiction described by Manz and Sims (1987). Research has indicated that there is a popular belief among managers that implementing SMWTs minimizes the need for managing the workforce. Nielsen (2000) reported a number of cases where the implementation of SMWTs involved cutting away one or more layers of middle management, assuming that SMWTs would entirely manage and support themselves. However, lack of management can have detrimental effects on employee well-being and performance (Nielsen, 2000). Further, there exists a body of literature that emphasizes the importance of supporting SMWTs in order for such teams to manage themselves efficiently (Manz & Sims, 1987; Pearce & Ravlin, 1992).

The notion that creativity and innovation is an easy process is wrong (West, 2000). Innovation represents a threat to the status quo so management need to create an environment where employees feel safe to develop and implement their ideas. Agrell and Gustafson (1996) and Metlay, Kaplan and Rogers (1994) all claimed that in order to implement successful workgroups who are innovative it is important to consider the organisational context to teams. Among other things it is important to create a management style where creativity and innovation is explicitly supported by the organization's management. It has been found that in order for a team to be innovative, support from management is crucial (King, 1990; King & Anderson, 1990). Further exploration of the interaction between the variables is necessary. It may be the case that a management that actively supports innovation mediates the effects of opportunities for learning and innovation on employee responses in terms

of exhaustion and job involvement and satisfaction. Further exploration of the importance the role of a management that actively supports learning and innovation may play in relation to how employees react to such opportunities for learning and innovation in SMWTs is required.

Manz and Sims (1987) have previously discussed the potentially different roles that internal team leaders (leaders working as a member of the team in addition to having management responsibilities) and external team leaders (leaders who are not members of the team and mainly have managerial responsibilities) have. In this study, the focus is on external team leaders. They are referred to as managers.

The main hypotheses of this study were:

1) SMWTs will be positively related to opportunities for learning and innovation and job satisfaction and involvement. Both job satisfaction and job involvement are investigated here, as it may be possible that employees are satisfied but apathetic; the degree of involvement tells us something about the activity level of employees. It is not clear whether working in a SMWT will have a positive or negative relationship with exhaustion.
2) Working in SMWTs will buffer the negative relationship between poor management and exhaustion, job satisfaction and involvement.
3) Opportunities for learning and innovation will be positively related to job involvement and job satisfaction.
4) A management who has a positive attitude towards and actively supports learning and innovation mediates the relationship between opportunities for learning and innovation and employee responses.

7.2 Methods

The measures used in this study were taken from case study B and were as follows (described in detail in section 3.2):

- The SMWT measure developed by the author.
- The opportunities for learning and innovation scale developed from the scales of Brenner and Melén (2000).
- Management support for learning and innovation developed by Brenner & Melén (2000).
- The job involvement scale extracted from Lawler & Hall (1970).
- The exhaustion scale from the GWBQ (Cox & Gotts, 1983).
- The single item job satisfaction measure.

7.2.1 Analysis

Analyses were carried out using SPSS version 10 (SPSS Inc., Chicago, IL).

First, the moderating effect of the degree to which employees were working in SMWTs on the relationship between supportive management, on the one hand, and exhaustion, job satisfaction and involvement on the other was examined using hierarchical multiple regression analysis (Cohen & Cohen, 1983). Interaction effects were investigated by including in the analysis both the SMWT scale and supportive management and the cross-product term. The test for an interaction effect is based on the variance explained by the cross-product term over and above that accounted for by the main effects. Second, the means, standard deviations, and intercorrelations among supportive management, opportunities for learning and innovation, and job involvement, job satisfaction and exhaustion were calculated. For the correlational analyses, Pearson's r (2-tailed) was applied. Finally, in order to investigate the possible mediating effects of a supportive management on the relationship between SMWTs and learning and innovation on the one

hand and job involvement (and job satisfaction), on the other, a series of hierarchical regressions were conducted in a three step procedure (Baron & Kenny, 1986) regressing job involvement, job satisfaction and exhaustion as outcome variables over innovation and a supportive management. In the first step, opportunities for learning and innovation as the independent variable and supportive management as the hypothesized mediating variable were introduced. In the second step, supportive management and the outcome variable were introduced. Finally, the outcome variable was regressed over learning and innovation (predictor) and supportive management (mediator). Mediation would be indicated if a) opportunities for learning and innovation affected supportive management, b) opportunities for learning and innovation affected the outcome variable and c) the regression coefficients for SMWT and learning and innovation and the outcome variables became non-significant or diminished following the introduction of supportive management in the final step (Baron & Kenny, 1986). When the residual effect of supportive management is not zero but significantly lower than in the first equation, the operation of multiple mediating factors is indicated. The strongest demonstration of mediation occurs when the effect is zero in the third equation, if this is the case, there is evidence for a single dominant mediator.

7.2.2 Analysing at the Individual Level

As in the previous chapters, the analysis was carried out at the individual level. As before, one-way ANOVA was conducted to investigate the appropriateness of analysing at the individual level rather than the team level. The one-way ANOVA indicated that there was no significant difference ($F(154) = 1.41$, $p = .15$). Therefore the individual level approach was confirmed.

7.3 Results

To test for hypothesis one and two, means, standard deviations and correlations among the SMWT scale, opportunities for learning and innovation and supportive management and job satisfaction, involvement and exhaustion were performed. These are shown in table 7.1.

Table 7.1: Correlations between scales

	Mean	*SD*	1	2	3	4	5
1. SMWT	11.12	3.33	1.00				
2. OLI (opp learn + inno)	17.13	4.87	.31**	1.00			
3. SUM (supp mgt)	16.17	4.30	.35**	.53**	1.00		
4. Involvement	12.59	3.67	.15	.31**	.18*	1.00	
5. Exhaustion	19.11	8.00	.14	.03	.15	-.19*	1.00
6. Job satisfaction	3.22	1.06	.16	.33**	.36**	.09	.41**

*p <. 05, **p < .01

The results of the Pearson's correlation analysis suggest that the greater the extent employees reported working in "pure" self-managing work teams, the more opportunities for learning and innovation and management support they experienced (r = .31; .35, p < .01). Opportunities for learning and innovation were in turn related to a supportive management (r = .53, p < .01), job involvement (r = .31, p < .01) and job satisfaction (r = .33, p < .01). This indicates that employees, who feel they have opportunities for learning and innovation are more involved, satisfied and report that management is supportive. The experienced support from management was related to increased job involvement and satisfaction. Interestingly, those who reported being exhausted also reported a high level of job satisfaction (r = .41, p < .01) but less involved with their jobs (r = -.19, p < .05).

The second hypothesis stated that employees who scored high on the SMWT scale but at the same time reported a lack of supportive management would report better well-being than those who scored low on

the SMWT scale. As can be seen in table 7.2, this hypothesis was only partially supported. Whilst it was found that employees who scored high on the self-managing work team scale reported being significantly less exhausted that those who scored low on the scale (ΔR^2 = .08; $F(3,133)$ = 5.26, $p < .05$) (see figure 7.1), this was not found for job involvement (ΔR^2 = .03; $F(3,136) = 3.79$) and satisfaction (ΔR^2 = .00; $F(3,109) = .34$).

Table 7.2: Hierarchical regression analyses results for supportive management as predictor and exhaustion, job satisfaction and involvement as criterion variable and SMWT as a moderator

	ß	ΔR^2	*F for* ΔR^2
Exhaustion			
Step 1: Main effects		.04	2.61
Supportive Management	.14		
SMWT	.10		
Step 2: Interaction		.08*	5.26
SMWT* Supportive Management	-1.05*		
Job Involvement			
Step 1: Main effects		.05	3.42
Supportive Management	.10		
SMWT	.15		
Step 2: Interaction		.03	3.79
SMWT * Supportive Management	.30		
Job Satisfaction			
Step 1: Main effects		.14***	8.91
Supportive Management	.37***		
SMWT	.10		
Step 2: Interaction		.00	.34
SMWT * Supportive Management	.10		

*p < .05; ***p < .001

Figure 7.1 shows the pattern of interaction effects of the SMWT scale. Those individuals experiencing a low degree of management support and, at the same time, scored high on the SMWT scale were less likely to be exhausted than engineers experiencing poor management support but at the same time scoring low on the SMWT scale.

Figure 7.1: Interaction effects for the effects of the perception of working in a SMWT on the relationship between lack of a supportive management and exhaustion

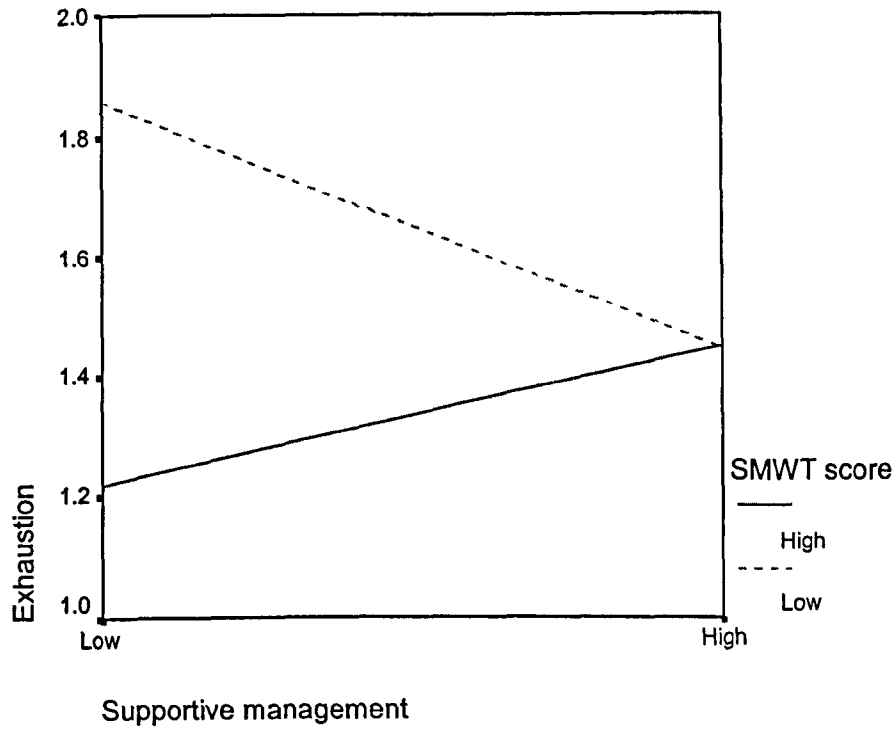
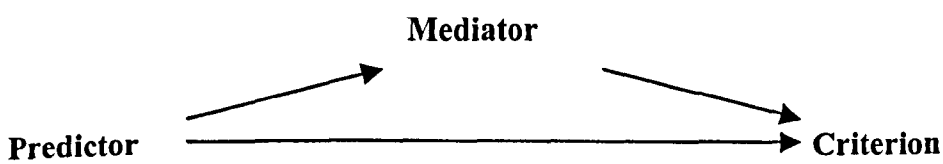


Table 7.1 indicated that no relationship between opportunities for learning and innovation and exhaustion exist, therefore regression analyses were not carried out to investigate mediating effects. Further, analyses testing for suppression effects were carried out. However, such effects were not found.

Figure 7.2: The mediation model



In order to investigate the importance of a supportive management on the relationship between teamwork and opportunities for learning and innovation, mediated multiple regression analyses were carried out. See figure 7.2 for a model of the mediation process. It was found that

variations in the degree to which employees reported working in a team (predictor) significantly accounted for variations in supportive management (mediator) ($\beta = .35, t = 4.41, p < .001$).
Comparison of the two regression equations shows that a supportive management partially mediates the impact of working in a self-managing work team (SMWT) upon opportunities for learning and innovation.

Regression equation 1:
Opportunities for learning and innovation = C + .31 (SMWT)
Regression equation 2:
Opportunities for learning and innovation = C + .53 (Supportive management) + .12 (SMWT)

Specifically, the initially significant relationship between predictor (SMWT) and criterion (Opportunities for learning and innovation) ($\beta = .31, t = 3.83, p < .001$) becomes non-significant when supportive management is controlled for ($\beta = .12, t = 1.66, p > .05$). This implies a partial mediation of supportive management on the relationship between the degree to which employees report working in a SMWT and their perceived opportunities for learning and innovation.

Further, regression analyses were carried out to describe the mediating effects of supportive management on the relationship between opportunities for learning and innovation and job satisfaction and involvement. It was found that variations in opportunities for learning and innovation (predictor) significantly accounted for variations in supportive management (mediator) ($\beta = .53, t = 7.59, p < .001$). Comparison of the four regression equations shows that a supportive management partially mediates the significant impact of exposure upon both job satisfaction and involvement.

Regression equation 1:

Job satisfaction = C + .33 (Opportunities for learning and innovation)

Regression equation 2:

Job satisfaction = C + .36 (Supportive management) + .18 (Opportunities for learning and innovation)

Regression equation 1:

Job involvement = C + .33 (Opportunities for learning and innovation)

Regression equation 2:

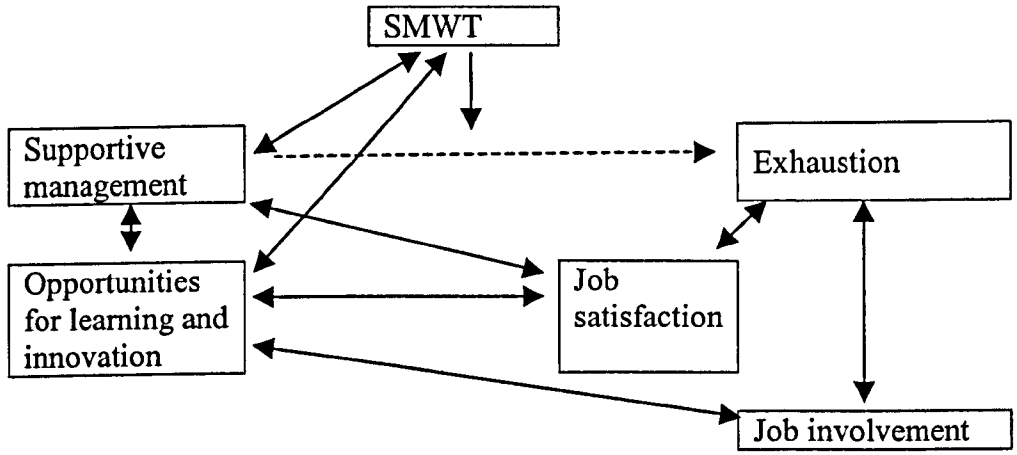
Job involvement = C + .29 (Supportive management) + .18 (Opportunities for learning and innovation)

As can be seen in the above regression equations, the initially significant association between opportunities for learning and innovation and job satisfaction (β = .33, t = 3.69, p < .001) becomes non-significant when supportive management is controlled for (β = .18, t = 1.73, p > .05). A similar result was found for job involvement: The initially significant association between opportunities for learning and innovation and job involvement (β = .33, t = 3.69, p < .001) becomes less significant when supportive management was entered into the equation (β = .18, t = 2.34, p < .05). This indicates partial mediation of supportive management on the relationship between opportunities for learning and innovation and job satisfaction and involvement respectively.

7.4 Discussion

Figure 7.3 provides an overview of the findings of this chapter.

Figure 7.3: Model of the relationships between opportunities for learning and well-Being in SMWTs



As can be seen in figure 7.3, employees who scored high on the SMWT scale also reported having good opportunities for learning and innovation and experienced having a supportive management. No direct relationship was found between the degree to which employees reported working in a SMWT and employee outcomes. Employees reporting a supportive management are more likely to experience opportunities for learning and innovation in their job, and the more such opportunities employees report, the more involved they reported being. Employees reporting a supportive management structure and opportunities for learning and innovation were found to report a high degree of job satisfaction.

Interestingly, those employees who were more satisfied with their job were also more likely to reported being exhausted. These results indicate that employees may at one time be satisfied with their jobs whilst at the same time be exhausted. Hart and Wearing (1995) found in their study that employees who reported high levels of morale concurrently experienced high levels of exhaustion. Broadbent (1995) has emphasized the importance of trying to separate factors that predict specific aspects of well-being. A similar finding was found by Nielsen (2000) who observed

that employees working in SMWTs did feel more stressed due to increased demands put on them but at the same time they also reported being more satisfied in that they experienced more opportunities for developing in their jobs and interacting with colleagues. Following this line of argument, it may very well be other factors in these SMWTs that predict symptoms of exhaustion. During the interviews and in the questionnaire, several factors of the job were reported that might be related to exhaustion. Employees reported a high workload and a lack of control over their workload, indeed Pearson's correlation analyses showed a relationship of respectively r = -.24 ($p <$. 05) and r = -.40 ($p < .01$). Further, it was reported that this workload was made worse by a number of projects running concurrently so that planning of one project was underway whilst another was carried out. Also, a lack of opportunity to prioritise between these tasks was reported. These factors were also significantly correlated with exhaustion (r = .33 and r = -.40, both p<. 01). Developing an understanding of the complexity with which employees respond to different work factors has implications for the assessment and prevention of risk in the workplace.

The second hypothesis was confirmed in that those employees who scored high on the SMWT scale were less exhausted than those who scored low on this scale. This buffering effect was not found for job satisfaction and involvement. This confirms the findings in case study A.

Research has indicated that working in SMWTs was related to increased opportunities for learning and innovation. Whilst this was confirmed, it was also found that part of this relationship may be accounted for by a management that actively supports employees in learning and innovation in their jobs.

The results in this chapter indicate that opportunities for learning and innovation are closely related to job involvement and job satisfaction. However, a management that actively supports learning and innovation

was found partially to mediate the relationship between opportunities for learning and innovation and involvement and job satisfaction, indicating that supportive management has an impact on involvement although no direct correlation was found. No such effect was found for exhaustion. The results indicate that management support for innovation may account for employee responses to some extent rather than the opportunities for innovation in themselves. This supports the literature described earlier, which emphasizes the importance of management support SMWTs. This has implications for how the context of SMWTs should be designed, organised and managed. Netterstrøm (1999) evaluated a study where bus drivers were organised in SMWTs. One of the conclusions drawn in this study was that team leaders lacked the adequate education and training in personnel management and supporting drivers.

To conclude, the picture of how employees respond to working in SMWTs is complex. Working in SMWTs was found to be related to opportunities for learning and innovation and a supportive management, but not directly related to employee well-being. Opportunities for learning and innovation were found to be related to employee responses. Relationships were found between opportunities for learning and innovation and job satisfaction and involvement. It was also found that these relationships were partially mediated by supportive management thus indicating that a supportive management may be equally important in accounting for the positive effects of SMWTs. However, exhaustion may also be experienced in SMWTs: a group of employees may be very satisfied with their job but at the same time also be at risk of suffering from exhaustion. This has implications for the design and management of work, indicating that involved and satisfied workers may still need a high degree of support in that they may concurrently be exhausted. This calls for a detailed approach to assessing and managing work-related stress.

8. Conclusion

This final section brings together the results and conclusions from the preceding chapters, which are examined in relation to the wider debates taking place within occupational and occupational health psychology. First, the results of the research chapters are discussed and some possible explanations for the observed effects are offered in terms of why these effects occurred in view of current research and theory. Second, the limitations of the work in this thesis are outlined and, finally, directions for future research are proposed and the practical implications of the thesis are described.

8.1 Introduction

The main aim of this thesis has been to investigate what the working conditions and well-being may be for employees working in organisations which apply different types of teamwork. Chapter 1 outlined current perspectives in teamwork and offered a definition of employee well-being. Chapter 2 reviewed the theory and research on employee well-being in teams and identified the major pitfalls in existing research. Chapter 3 described the methodology used, more specifically the risk management framework and described two case studies including an in-depth analysis of the types of teamwork in the case study organisations. The research chapters in this thesis aimed to address some of the shortfalls in current research. Chapter 4 offered an in-depth analysis of what the working conditions were in the two case studies and related these to a) current theory and b) each other. Chapter 5 investigated the moderating effects of the degree of teamwork on the relationship between adverse working conditions and employee well-being, whilst chapter 6 investigated how the quality of teamwork moderated the impact on management on employee well-being. Finally, in chapter 7, the opportunities for learning and innovation in SMWTs were investigated based on the results of chapter 6. This final chapter considers the findings and conclusions of previous chapters, and discusses these in relation to current theory and research in occupational and occupational health psychology.

8.2 Work and Well-Being in Teamwork

Despite the existence of a theoretical body of literature concerning the psychosocial hazards that might be prevalent in teamwork organisations, one of the shortcomings of contemporary research has been a lack of attention to what actual working conditions may be and how these are related to employee well-being in such organisations. This was investigated in chapter 4. It was found that employees did indeed report a number of psychosocial hazards, mostly related to management or issues that could be led back to management. Mintzberg (1979) distinguished between four types of organisation, one of these he named the professional organisation. He defined the professional organisation as comprising high degrees of standardisation of skills, an operating core, horizontal as well as vertical decentralisation and finally little formalisation. This low degree of formalisation has been believed to lead to frustration amongst employees and can be seen as a lack of a structured performance framework (Burns & Stalker, 1961). This was reported by employees in both case studies in chapter 4. Although the two organisations had designed different types of teamwork: Japanese style teams and self-managing work teams, similar problems were found across the board. However, they varied slightly according to the culture and management in each organisation. In fact, in case study B, where employees were supposed to be self-managing, more hazards were reported. It was felt that management took little interest in employee issues but focused on introducing changes where these were not necessary. Such problems had been predicted by existing theory, although not necessarily to the degree found in these two cases. The management issues are a recurrent theme in this thesis and are discussed in detail below.

As predicted by theory, time pressures were high, in that teams were responsible for meeting their own deadlines, but also because they had a number of administrative tasks they were responsible for. In case study B, this was exacerbated by an unclear structure, where there was no system in place for identifying which team should be responsible for a project. This meant that

a project tended to be carried out by the person(s)/team(s) on whose desk the project landed regardless of expertise.

Current theory predicts problems with communication across and internally in teams. This was supported by the findings in chapter 4. The unstructured environment resulted in teams avoiding communication with other teams as they would either be given more work or (as was the case in case study A) would have to change work already done to fit in with the work of other teams. This can be seen as the attempt to protect the boundaries of the individual team and keep time pressures down. Winnubst and Schabracq (1996) hypothesised that in the professional organisation, work overload and problematic interpersonal relationships would be prevalent. Both were found in the two organisations. Problems within the SMWTs were also reported in case study B, and this was primarily related to the design of teamwork.

In case study B, SMWTs were in some cases organised as "virtual teams" operating on two different continents. This created problems in terms of poor communication and interaction due to cultural differences and teams trying to work together across different time zones. Also, it is questionable whether teams which are located in distant geographic locations develop a team identity. Further research is required to investigate the effects of "virtual teams" on employee well-being, investigating the cultural differences and communication. However, it may be useful to draw upon existing research to get an idea of how "virtual teams" may influence working conditions and employee well-being. Kirkman and Shapiro (1997) hypothesised on the basis of Hofstede's (1980) work that SMWTs may not be equally successful in all cultures. For example, in cultures in which there is traditionally a resistance to working together and autonomy, SMWTs may not have the expected beneficial effects. These may be cultures where there is a high degree of individualism, of determinism, distance between management and workers and where work is seen as the means to a goal rather than a goal in itself. It is reasonable to assume that the US and the Netherlands differ in these two aspects, for example, the US is widely known to be very individualistic. Also

the importance of having regular team meetings has been investigated, which may give a pointer in the direction of the problems virtual teams may experience. Magjuka and Baldwin (1991) investigated the relationship between the amount and length of meetings and team effectiveness. They did not find any relationship. However, in the qualitative study by Nielsen (2000), it was reported that meetings were important in the respect that teams that did not meet on a regular basis did not have any reason to meet because the level of control over their work was very low. This may be the case in case study B.

Professionals traditionally can be said to have a high degree of autonomy over their daily work. However, it may be that the SMWTs in case study B had little further control and thus it is questionable whether they can be said to actually work in SMWTs if they did not have much control over their work apart from what professionals traditionally have and that they did not operate as a team. The cluster of issues reported as psychosocial hazards in case study B related to decision latitude and control supports this. This poses interesting questions regarding the SMWT structure. According to the definition of self-managing work teams, these teams should, as a minimum be responsible for the execution, planning and scheduling of their daily task. However, the psychosocial hazards reported in case study B related to the higher level control in decision making processes. This indicates that it is important not to investigate self-managing work teams as an entity but focus to a higher degree on the level of control and areas of responsibility allocated to SMWTs. To date, little research has been conducted to distinguish between the different types of control. Such research was primarily carried out in the 70s (Gulowsen, 1971; Susman, 1976) and later by Ulich and Weber (1996). Griffiths (1999) argued that in current literature, control is used to cover a variety of constructs such as participation in decision making, decision latitude, variety of skills, autonomy, influence, challenges, empowerment, ownership and workplace democracy. The concept of control has been used to cover constructs at a variety of levels: control over the task itself, control over the working environment, over the organisation and management at work, over career development, or control over others. In order to develop a detailed

understanding of teamwork, researchers should investigate in detail how the different levels of control may influence employee well-being. Professionals traditionally have a high degree of autonomy over their daily work in contrast to, for example, assembly line workers; it may be that employees working in professional SMWTs may have a higher need for further influence and participation and work than assembly line workers in order to reach their full potential.

In case study A, an organisational pathology was related to the reward structure, which supported individual performance; there were no team-based pay or bonuses. Procter and Mueller commented in 1999 on the lack of research of how teams should be rewarded. However, they did make some suggestions on how teamwork should *not* be rewarded. For example they suggested that pay-for-performance would have detrimental effects on performance. It can be assumed that the unfairness of pay across the world and individual bonuses have detrimental effects on performance as well as well-being as found in chapter 4. Rather, Procter and Mueller (1999) recommend a combination of pay for knowledge (pay where employees are based on the number of skills they have acquired (Weisbord1992)) and team-based pay (where pay and/or bonuses are distributed based on the performance of the team as a whole (DeMatteo, Eby & Sundstrom, 1998)).

Finally, a series of issues were related to career development and progression. The hypothesised problems with vertical progression in case study B with SMWTs were not found. Rather it seemed that the organisation had successfully implemented an open-resource system where employees would change jobs every four years to ensure personal development. However, issues were raised regarding the efficiency of this system so in getting rid of one problem it seemed that other problems had arisen.

Overall, the conclusion of chapter 4 is that a number of organisational pathologies existed that were not eliminated by implementing various types of teamwork. Thus it may be concluded that teamwork may not be a miracle

cure, as claimed by some. This is supported by chapter 5, which investigated in detail on which working conditions working in a team may have a buffering effect on low employee well-being.

Chapter 5 found that team interdependence only buffered the effects of a few of the adverse working conditions on employee well-being. Depending on the outcome measure, the degree to which employees reported working in a team buffered the harmful effects of not communicating with management (particularly exhaustion) and peers across departments and locations (tension and exhaustion). Team interdependence moderated the effects of limited autonomy in your work on all three outcome variables. Based on qualitative accounts, it was hypothesised that such effects may be due to the increased social support provided by teams in which employees are highly dependent on each other and work towards a goal – they feel part of an entity. Team interdependence was found to moderate the relationship between the amount of overtime and job satisfaction; it was hypothesised that such effects may be due to employee solidarity; when you work towards a goal together, it is perceived worthwhile to work overtime under unsatisfactory conditions. The feeling of "being in the same boat" may also explain why team interdependence buffered the negative impact of supervisors' limited autonomy. In a few cases a high degree of team interdependence was associated with poorer well-being. In conclusion these findings indicate that the notion of teamwork as the solution to "all evils" is fraught with problems. The literature that claims that working in teams is beneficial for the employees should be taken with a "pinch of salt" as the results in this thesis indicate that working in teams is no miracle cure, only certain aspects of work were found to be buffered by working in a team. In fact, in a few cases a high degree of team interdependence was related to lower well-being.

However, in order to investigate in further detail *why* teamwork has these buffering effects, the team process factor "team climate" was used to identify which aspects of teamwork may have a particularly strong buffering effect. As predicted, it was found that participative safety, perhaps due to its resemblance

to informational social support, had a strong buffering effect. However, team support for innovation was also a strong buffer on the negative relationship between poor management and exhaustion. It was hypothesised that the reason for this may be that in this sample consisting of engineers primarily where the demands of innovation were high (they were responsible for designing cars), it may be that teams take over the management function of supporting each other where management fails to provide such support. Cutrona (1990) has developed an interesting model on the role of social support based on the specific type of stress and the type of social support. She hypothesised that for each cluster of stressors, tailor-made support will be most efficient. Building on this theory, it may very well be that informational support - team members providing each other with the appropriate information to complete the task and support for innovation - is the most efficient in the two case studies. It is likely that in this type of profession of engineers, who traditionally experience a reasonably high level of control and autonomy in their work, social support, which actively provides employees with information on how to do their job and solve problems may be more beneficial than other, more passive types of support, which may be efficient in organisations where employees have less control over their working situation. This demonstrates the importance of well-functioning teams with healthy team processes combined with high degrees of autonomy. This is supported by Quick, Paulus, Whittington, Larey and Nelson (1996) who hypothesised that the reason why social support may be beneficial in teamwork may be that a supportive atmosphere minimises interpersonal conflicts and provide a framework through which team members can address psychosocial hazards outside and inside the workplace. This has interesting implications for the design and management of work in that, if this is the case, organisations with high demands of innovation may benefit from implementing teams to support such innovation. Based on these conclusions, it was hypothesised that in organisations where team members have a high degree of control over their work, i.e. self-managing work teams, opportunities for learning and innovation may be even higher due to the opportunities for organising work in a way that supports innovation to an even higher extent.

To investigate the aspect of innovation in greater detail, chapter 7 investigated the relationship between the degree to which employees reported working in SMWTs and the opportunities for learning and innovation. It was found that these were positively correlated and that SMWTs significantly predicted opportunities for learning and innovation. However, it was found that management accounted for some of the relationship between SMWTs and opportunities for learning and innovation and mediated the relationship between these opportunities for learning and innovation and well-being. This indicates that although a well-functioning team may take over some of the supportive functions where management fails to provide support, this should not be seen as an excuse for not supporting SMWTs: some of the effects of opportunities for learning and innovation were mediated by management support, but although teams may be partially able to provide such support, this should not stand alone. Management support is also important, even in SMWTs where team members themselves have management responsibilities.

Whilst managers cannot be expected to create healthy, productive environments free of stress, in collaboration with team leaders and employees they do, however, have the opportunity to support teamwork in a way which may bring about improved employee health and well-being. It has often been found that teams that are left to their own devices exhibit flawed decision making, unproductive members and social loafing (Quick et al., 1996). Hackman and Walton (1986) have developed a set of guidelines for how teams should be managed in order to achieve the beneficial effects of teamwork: first, it is important that teams have clearly defined and respected leaders (one could add that even in cases where there is no immediate team leader but these roles are either shared between team members or are allocating on a rotation basis, the same applies; management-related roles should be clearly defined and respected). Second, leaders should keep the team focused on the task and recognise the importance of both task and interpersonal skills. Third, a team leader should be a good communicator, who encourages communication amongst team members (and even/also acts as the communication link between the team and other teams and senior management and encourages

direct communication between these). Fourth, team leaders should be active in establishing norms and procedures that facilitate efficient interaction, and finally, at the higher management level, rewards, resources and information should be readily available for the team to complete their task.

Tjosvold (1991) further outlined the roles an effective manager should take in ensuring innovative teams. Tjosvold stated that the manager should be able to formulate the vision and objective of the team, he should define the task of the team thereby making the boundaries surrounding the team clear, empower team members to make necessary decisions and provide the necessary information for these decisions, he should support the exploration and implementations of solutions and facilitate the reflection, evaluation and process of ideas and their implementation. Finally, he should provide the link between the team and the organisation integrating the organisation's overall objectives and the team's objectives.

Gard (2000) found in her study of a Swedish merger that employees felt that management support was important and that this may be important for innovation. Mayer (1970 in Gard (2000)) outlined the role of a manager supporting innovation to be the teams' 'central nervous system' in the sense that he or she receives information, facilitates communication and integrates incoming information. Internally, the manager must be open to discussion and encourage team members in reaching and implementing their own solutions rather than enforcing his own. A leader should further encourage and support new ideas and should be able to formulate objectives and visions.

West (2000) distinguishes between two types of leadership: transformational and transactional. Whereas transactional leaders focus on transactions in terms of reward and punishment, the transformational leader manages by encouraging employees to transform their views of themselves and their work.

The possession of such leader- and management skills should be taken into consideration when recruiting and training managers to support SMWTs. One

explanation for the previous lack of attention to the managerial skills supporting innovation in SMWTs may be that much research on SMWTs has previously taken place within manufacturing (Thompson & Wallace, 1996), where the demands for innovation may be less dominant. However, innovation is also important in the development of working procedures and methods, even if the pressures for innovation may be weaker within manufacturing than within project management and product development. Thus, innovation in manufacturing SMWTs is also vital if SMWTs are to be exploited optimally.

An example of how SMWTs should be managed has been given by Gyllenhammar (1977). With the implementation of SMWTs in Volvo in Sweden, the role of managers changed from that of giving orders to listening, motivating and facilitating compromises. The function of managers was to create an environment where the people who mattered would be able to have ideas and try them out. Furthermore, the management support included support for innovation in that employees were encouraged to be innovative and the resources were made available for them to be innovative. Also training was made available for teams and managers to understand the innovative processes and encourage innovation.

8.3 Limitations

Overall, the main weaknesses of the studies were their cross-sectional nature, the issues of number of participants, reliance on self-report data and the restriction of study population to the engineering sector.

The studies were cross-sectional in design and, whilst the relationships were in the predicted direction, issues of reverse causality cannot be ruled out. It may be that employees with good mental health enter well-functioning teams or that individuals who experience high levels of well-being may work better and harder towards creating well-functioning teams than individuals with fewer resources. However, despite the studies using a cross-sectional design, the

design was appropriate for answering the questions of identifying psychosocial hazards in the organisations at a given point in time and the dynamics between working conditions, team aspects and employee well-being.

Due to the risk management methodology, the tailored questionnaires made it difficult to make any statistical comparisons between the two case studies and the different types of teamwork. However, the main focus of this thesis was to investigate the complexity of teamwork dynamics rather than comparing different types of teamwork.

The teams in case study A reported only a moderate level of task and outcome interdependence. Wageman and Baker (1995) found in their study that hybrid teams, (i.e. teams with both interdependent and individual responsibilities), were less effective than teams with purely interdependent tasks. The same mechanism may play a part in the results in this study. It may very well account for the fact that team interdependence was only found to moderate a smaller number of psychosocial factors presumably because the teams only possessed a moderate degree of interdependence.

The number of participants in the studies, particularly in case study A, was relatively small, which restricted the analyses that were carried out. However, as both were populations rather than just samples they provide us with a detailed picture of the mechanisms in the departments in the two organisations.

There is an ongoing discussion concerning the distinction between the "objective" and the "subjective" work environment (Rial-González, 2000) (see chapter 3 for an initial introduction to the criticism of self-report data). The former refers to the "real" characteristics in the environment, which can be objectively measured. The "subjective" environment can be measured using self-report data. Such self-report data of job characteristics and well-being are common methods of data collection and remain popular despite arguments that such methods are flawed (Spector, 1994). The use of self-report data is open to

the criticism that reports may be influenced by the individual's construction of the environment based on his or her perceptions and evaluation of the assumed "objective" characteristics. It has been argued that such bias influences reports of job characteristics and well-being, inflates correlation and is prone to change through social interaction. However, following the argument put forward by Lazarus and Folkman (1984), it is the individual's appraisal of a situation that determines his or her behaviour and perception of well-being and thus is the appropriate level of analysis. Indeed, it has been suggested (Cox & Griffiths, 1996) that research simply trying to relate "objective events" to health outcomes – ignoring the appraisal component – may lose out on important cognitive and emotional processes (Dewe, 2000) and that "objective" working conditions may not be the best predictor of employee well-being (Spector, 1987). This has been found, for example, by Stansfeld, North, White and Marmott (1995), who examined the association between self-reported and externally assessed working conditions. They found that self-reported data were significantly associated with psychiatric disorder whereas this was not the case for the "objective" data. On the basis of these findings, Stansfeld et al. concluded that the subjective perception of working conditions may have a mediating effect between the objective working conditions and employee well-being. There is also the issue of common method variance. This issue can be addressed by triangulation in terms of observation studies, interviews and external ratings of team behaviour. However, such methods are time consuming and as it has been put forward, external ratings do not necessarily offer better predictive value (Campion et al., 1996; Stansfeld et al., 1995).

Further, this study focuses on employees within the engineering sector and related professional disciplines. It may be that some of the results can be attributed to the particular type of work in this profession. However, since most research has previously been carried out to investigate teamwork in manufacturing, one of the explicit objectives of this thesis was to explore teamwork issues in engineering and related professional disciplines. Further, the outcome measures in this study only included employee well-being rather

than measures of organisational performance. Often job satisfaction and job involvement are seen as the primary measures of organisational health. However, it would have been useful to include direct measures of productivity and performance as occupational health psychology is concerned with both (Kompier, Geurts, Grundemann, Vink & Smulders, 1998; Quick et al., 1996).

8.4 Future Research Directions

The initial focus of future research should be to replicate this work to further confirm the findings and explore in more detail the mechanisms by which teamwork may influence employee well-being and working conditions.
In order to understand how teamwork may influence working conditions and employee well-being, several strategies may be applied:

At the microlevel, qualitative methodologies and case studies are often disregarded in research. However, such techniques may be useful when questions of "how" and "why" are asked and when the researcher has little control over events and when the focus is on a contemporary phenomenon within a real-life context (Yin, 1994). Griffiths (1999) has sung the praises of qualitative methods when evaluating organisational interventions for three reasons: qualitative research a) provides data which allows the researcher to investigate the context – i.e. gather a richness of data that can explain the context of findings, b) is useful in the generation of new theories whereas quantitative research mainly aims to confirm existing theories and finally, c) it is useful in the early phases of problem analyses and design of a project. Research is not only about predicting behaviour but can also help us understand the world in a different way (Griffiths, 1999). A number of qualitative methods could be applied in exploring teamwork in organisations in further detail such as team observation, diary studies, interviews and focus groups. This would enable a more in-depth understanding of the mechanisms by which teamwork influences working conditions and employee well-being. Also, at the micro-level more attention should be paid to individual preferences for teamwork. This would also address the question of selection

bias; e.g. the possibility that individuals working in teams do so because they choose to and that it takes a certain kind of person to function well under conditions of teamwork.

At the macrolevel, team surveys exploring the relationships between working conditions, team processes and employee well-being should be conducted. More sophisticated statistical analysis would allow for the development of elaborate models providing a detailed understanding of the dynamics of teamwork. Also multi-level analyses should be carried out. In this thesis all analyses were carried out at the individual level. It may be useful to conduct multi-level analyses. One would expect that well-being measures should be at the individual-level; however, it may be useful to combine group - and individual level analysis, for example, when analysing interdependence. Whilst it can be hypothesised that outcome interdependence is shared at the group level, task interdependence may vary within the group. Conducting multi-level analyses would allow the researcher to grasp such nuances. Also future research should make better use of the "emergent variability" within populations (Randall, 2002) in a more structured way. An example can be found in Parker and Williams (2001) where teams in an organisations were divided into two groups depending on the degree to which team members reported to be self-managing and comparisons were made on this basis.

In addition, longitudinal studies should be carried out implementing interventions at different levels to study the effects of how teamwork interventions may be most efficiently handled. As mentioned in chapter 2, an increasing number of organisations implement teamwork. This offers opportunities for longitudinal studies investigating the effects of teamwork. Interventions in existing teamwork scenarios should also be considered. Currently, there are a wide range of teambuilding exercises around; however, little has been done to validate their effects research and to justify how these work. Such teambuilding exercises may have beneficial effects, however, these techniques seldom come under scrutinised examination.

It is important to note that no study should focus on one technique rather than the other; by combining a variety of techniques (both quantitative and qualitative) combined with the use of existing organisational data and external ratings, the principles of triangulation may be achieved (Cox, 1993). There are a number of ways in which qualitative and quantitative methods may be integrated. For example, the approach used in the risk management framework and thus in this thesis, qualitative data are used to construct a tailored questionnaire. The results of these are then analysed and further qualitative data may subsequently be collected through more interviews of discussions with the Steering Group(s) acting as focus group(s). However, there are also other methods: a) a method often used in assessment centres is the multi-method approach (Smith & Robertson, 1993) where qualitative and quantitative data are combined to investigate the same phenomenon; an example may be to both ask in an interview about the degree to which they felt their team fits a definition given of teamwork and at the same time distribute the team interdependence questionnaire or a similar measure of teamwork as used by Cohen and her colleagues (van der Vegt et al, 1998; Cohen Ledford & Spreitzer, 1996), b) another strategy is where qualitative and quantitative approaches guide each other, for example, where questionnaire results are used to inform the content of the qualitative analysis (Miles & Huberman, 1994), e.g. team interdependence would be explored in more detail and c) and finally there is the approach of conducting several surveys with qualitative data collection in between. An example could be where the TCI-short would be distributed, followed by semi-structured interviews, used to inform a more detailed questionnaire investigating the results of both the first round of the quantitative survey and the interviews.

Using multiple methods would increase our understanding of teamwork and allow researchers to make more detailed recommendations on how to plan, design and implement teams, information which is invaluable for today's managers.

8.5 Practical Applications

In this section, the practical implications for the implementation of teamwork and risk management are considered. It is widely acknowledged that improving the design management and organisation at work may be essential to improving employee health and well-being (WHO, 1999).

The results of the research in this thesis indicate that the outcome measures must be considered when conducting risk assessment. Teamwork may have very different influences on particular outcome variables. This is in accordance with Seers, McGee, Serey and Graen (1983) who concluded in their study of the buffering effects of social support that it is important to take into consideration both the sources of stress and their effect on specific outcomes: this is described in chapters 5 and 6. This should be considered in further detail when carrying out a risk assessment because different results lead to different conclusions about teamwork. Often risk assessment is carried out with the aim of improving "quality of working life" or "employee well-being" instead of considering that results may depend on the outcome variable measured rather than the actual moderator. Kivimäki, Sutinen, Elovainio, Vahtera, Räsänen, Töyry, Ferrie and Firth-Cozens (2001) reached the conclusion that work redesign to minimise absenteeism in hospital physicians should concentrate on developing teams and team leaders, as they found that problematic teamwork explained long-term absence. However, this approach is problematic as absence is but one measure of employee well-being; thus other aspects of the working conditions may influence other aspects of employee well-being and have equally detrimental effects. In addition, it is important to include both measures of positive and negative well-being. Nielsen, Cox and Griffiths (submitted) found that employees in SMWTs who report opportunities for learning and innovation and at the same time were highly satisfied with their jobs were less exhausted than those who were less satisfied with their jobs. Thus it may be that the implementation of SMWTs as a way to provide opportunities for learning and innovation may not have a direct effect on exhaustion. It may be that exhaustion symptoms are minimised not by opportunities for learning and innovation themselves but by way of

increasing job satisfaction related to these opportunities. Randall, Griffiths and Cox (2001) have named these kinds of situations "protective interventions". Although interventions may not have a direct effect on exhaustion they may help minimise negative employee responses in that they affect aspects of the job that are related to positive responses and thus may strengthen how employees respond to their working conditions overall.

When management considers implementing teams as one way of improving employee well-being, careful attention should be paid to how teamwork is designed and managed. First, it should be considered whether teamwork is appropriate in relation to the task. If the task cannot be designed in a way which ensures task and outcome interdependence, alternative ways of reorganising work should be considered. For example, it is challenging to ensure task interdependence in "virtual teams" in that it poses serious threats to the development of a team identity and effective communication. Also, if the primary team task evolves around separate projects all over the world it can be questioned whether task and outcome interdependence could be achieved: whether the team can be said to have a true purpose. Managers should also consider the level of autonomy delegated to teams: The more autonomy teams have the greater the chance that the beneficial effects of team are released in terms of increased skills use, learning and innovation. Various degrees of autonomy can be delegated to teams in terms of people management (job allocation, team membership, working hours, rules, etc) and management of the task itself (e.g. quality control, setting objectives, financial responsibility). Second, whilst the results of the studies in this thesis indicate that social support and the opportunity to be innovative working in teams is important for employee well-being, careful attention should be paid to the design and implementation processes in order to ensure that the context actively supports this type of work design. For example, if managers do not take responsibility for providing an overall framework and vision and to support teamwork using a participatory leadership style that encourages employee learning and development, the beneficial effects of teamwork may be not be achieved. It is also important to consider the physical work

environment both with respect to facilitate effective communication and the nature of the team task. Equally important is it to consider alternative reward structures that encourage the co-operation of team members. In teamwork structures where layers of middle management are reduced, opportunities for horizontal progression, i.e. acquiring new skills should be considered. Failing to consider these issues may result in teamwork not achieving the objectives behind work reorganisation into teams.

As discussed in the literature review, interventions rarely manipulate just one variable, therefore it is naïve to assume that implementing teamwork in the organisations may improve employee well-being without considering how such interventions may influence other aspects of the working environment. On the other hand it is also naïve to assume that by implementing teamwork may you improve employee well-being simply by providing increased opportunities for social support: in some cases, control is understood as autonomy and opportunities for using more skills and learning and innovation.

8.6 Concluding Remarks

In conclusion, teamwork has been found to be positively related to employee well-being in a number of ways in this thesis. However, these findings should be interpreted with caution, it may very well be that these findings are restricted. It seems reasonable to assume that factors such as societal culture, organisational culture, the type of teamwork implemented, the occupation and education of team members, the nature of the team task and the sector in which the study is carried out have an impact on the findings. The results of this thesis does offer an in-depth understanding of what the working conditions may be for employees engaged in teamwork in professionals. The results indicate that the positive effects of teamwork on employee well-being may be limited and it is important to look at other aspects of the way work is organised, designed and managed in order to promote employee well-being. This is in accordance with Kompier, Cooper and Geurts (2000, p. 166), who recommend that interventions should fit in with the problems identified in "an

adequate diagnosis or risk analysis". To achieve such an adequate risk analysis, the results of this thesis indicate that it is important to include teamwork issues in the measurement of working conditions where teamwork is part of the job design. The results of this thesis indicate that teamwork may be used to improve employee well-being but should not perceived as sufficient even if in some cases they may be adequate.

The results of this thesis suggest that the type of teamwork which offers opportunities for informational social support and support for being innovative in your job is associated with higher well-being than teamwork where management support is lacking. On the other hand, it was also found that better well-being was experienced where both management support and high quality teamwork exists. These findings are important for designing and managing work within the engineering sector and related disciplines. There are immense pressures on today's organisations to be innovative and the results in this thesis indicate that teams and SMWTs may facilitate such innovation. However, the results also indicate that it is important to consider the context, here in term of management, when organising work in SMWTs. The challenge is to develop clearly defined teams with excellent team processes in an environment, which actively supports teamwork. This will enable employees to adapt to and develop in the stressful environment of today's organisation.

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Appendix 1:

Risk Assessment Survey in Case Study A

Institute of Work, Health and Organisations

University of Nottingham Business School
Jubilee Campus, Wollaton Road, Nottingham NG8 1BB, UK
http://www.nottingham.ac.uk/unbs/i-who

A World Health Organization Collaborating Centre in Occupational Health
European Agency's Topic Centre on Stress at Work

The [redacted] Project in [redacted]

What is the project about?

[redacted] has agreed to be part of a project that is being carried out by a team of researchers from the University of Nottingham. [redacted] has agreed to take part in this project. [redacted] sponsors the work by a donation to the Development Office at the University of Nottingham.

The aim of the project is:
To identify sources of stress, work satisfaction and support, and where reasonably practicable to improve the situation to the benefit of the workforce. This may include both addressing the weaknesses and building on the strengths of particular situations.

This survey is the initial phase of this project and looks at the good and the bad things about your job. The Research Team will return from time to time over the next 12 months to see whether any changes are making things better for staff.

What are the benefits?

The project offers you the chance:

- to highlight any problems you face when doing your job. At the same time you will also be asked to provide information about your well-being. By looking at these two pieces of information together it is possible to see which aspects of work should be targeted for improvement.
- to receive independent feedback on problems and sources of work satisfaction.
- to have your comments reviewed confidentially by an independent body and fed back to [redacted] senior management.
- to improve your work situation. Where ***practicable***, changes will be made within [redacted]. Although it may not be possible to make work better for everyone, it is hoped that some improvements can be made.

How confidential is the information I provide?

The only people who will see your completed questionnaires are the researchers from the University of Nottingham. No [redacted] employees will see them. The questionnaires are not coded or numbered in any way; they are anonymous and no information provided on them will be used to identify individuals. The results from the survey will look at groups of staff and not individual responses.

What will happen to the results of the questionnaire?

The results will be analysed by the Research Team at the University of Nottingham. The Project has the support of [redacted] and [redacted]. Once analysed, the results will be used to plan forward actions with the Research Team's support. You will all receive a summary of the key findings, and proposals for action.

Questionnaire completion: We would be grateful if you complete this questionnaire in a quiet and unhurried atmosphere. It should take about 25 minutes to complete.
Return dates: When you have completed your questionnaire, please put it in the envelope provided and give it back to Karina Nielsen from the University of Nottingham who will be sitting in [redacted] the 29th and 30th of June from 12.00-16.00 or post it directly back to her at Nottingham before June 30th. No stamp is needed. Remember, no-one who works for [redacted] will see your completed questionnaire. It is completely confidential.

We need your help! In order for us to make a real difference it is very important for us that as many as possible return the questionnaires. Thank you in advance for your help and co-operation in this important project.

University of Nottingham Research Team

ABOUT YOU

Please remember that this information will not be used to identify individuals. It will only be used to interpret some of the measures used in the questionnaire, and will help target any improvements made as a result of the project. Do not write your name on this form.
In order to ensure anonymity, questionnaires from teams where fewer than five members answer will be analysed at the next level.

Education .....

Team (e.g [redacted]) .....

Gender ( ) Male ( ) Female

Grade
☐ [redacted] or below
☐
☐ [redacted] or above

Age (please tick)
☐ 25 years or younger
☐ 26-35 years old
☐ 36-45 years old
☐ 46-55 years old
☐ 55 years or older

How long have you worked for [redacted]?
☐ Less than one year
☐ 1-5 years
☐ 6-10 years
☐ 11-15 years
☐ 6-20 years
☐ 21 years or more

How long have you worked in [redacted]?
☐ Less than one year
☐ 1-5 years
☐ 6-10 years
☐ 11-15 years
☐ 16-20 years
☐ 21 years or more

Approximately, how many extra hours do you do per week? .....

YOUR VIEWS ABOUT THE WORK

The next section is about your views of your job. The statements are based on the discussions that were held with some of you during May and reflect some of the bad and good things about the work raised. Please mark any items (in the NA column) which are not applicable or relevant to your work situation. For any item applicable, please indicate whether it is a problem for you, whether it is good or neither by ticking in the appropriate column. (E.g. if a high workload is a problem for you tick box 0, if it is neither problematic nor good tick box 1, or if a high workload is good for you tick box 2.)
***If* you tick more than three boxes as problematic in any one boxed section, please indicate which three are the most problematic for you and rate these 1-3.**
At the end each section space has been made available for you to make comments. If you would like to clarify a statement further or suggest how improvements can be made, please use this space.

Example:
Key: (0) Problematic (1) Neither problematic nor good (2) Good
If you think a high workload is problematic tick box 0

Getting the work done	NA	0 P	1 NP/ NG	2 G	Priority 1-3
A high workload		√			

Getting the work done	NA	0 P	1 NP/ NG	2 G	Priority 1-3
A high workload					
Pulling the programme ahead					
Control over workload					
Constant time pressures					
Strict/short deadlines					
Little time available for 'actual engineering work'					
Time spent on reporting information					
Time spent in meetings					
Discipline during meetings					
Relevance of meetings for my work					
Opportunities to see the results of my work					
Opportunities to engage in a variety of different tasks					
Opportunities to make decisions about my work					
Not enough information available to complete the work					
Information not received in good time about directional changes					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Work organisation	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Opportunities to take breaks during working hours					
A lot of overtime					
Unpaid overtime					
Unpredictability of overtime					
Opportunities to plan ahead and make strategies					
Opportunities for reviewing and learning from work					
Opportunities of supervisors to make decisions during the working day					
Distant geographic location of management					
Opportunities to communicate with management					
Manufacturing people being located elsewhere					
Manufacturing plant being located elsewhere					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Example:

Key: (0) Problematic (1) Neither problematic nor good (2) Good
If you think a high workload is problematic tick box 0

Getting the work done	NA	0 P	1 NP/ NG	2 G	Priority 1-3
A high workload		√			

Role at work	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Clarity of roles and responsibilities					
Other teams' understanding of what my job is about					
Supervisors' understanding of what my job is about					
Contractors' understanding what my job is about					
Conflicting targets and priorities from contractors and supervisors					
Meeting conflicting demands and targets from various areas					
Pride in producing a good quality car					
Sense of responsibility for occupant and pedestrian safety					
Policing contractors					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Pay and promotion	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Fairness of pay system					
Limited number of bonuses					
Small bonuses					
Fairness of distribution procedures for bonuses					
Consistency of pay across the world					
Fairness of overtime rates					
Job security					
Opportunities for promotion					
Incentives for promotion					
Procedures for promotion					
Opportunities to move around once you are in a programme/ [redacted]					
Financial support for further education					
Provision for career guidance					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Example:
Key: (0) Problematic (1) Neither problematic nor good (2) Good
If you think a high workload is problematic tick box 0

Getting the work done	NA	0 P	1 NP/ NG	2 G	Priority 1-3
A high workload		√			

Organisational issues	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Team staffing levels					
Use of company jargon					
Prioritising between objectives					
Unrealistic targets					
Unrealistic deadlines					
Late product changes					
Amount of training necessary to do the job					
Relevance of training					
Formal appraisal system for engineers					
Formal appraisal system for supervisors					
Managers' lack of recognition of limitations of technology					
Managers' lack of recognition of engineer judgement					
Managers' lack of use of experience from engineers and previous programmes					
Responsibility for the work of contractors					
Experience and training of contractors to do their work					
Changes in other areas forcing me to change my work					
Amount of feedback from management					
Quality of feedback from management					
Amount of feedback from other areas					
Format and content feedback from other areas					
Amount of recognition from supervisors					
Amount of recognition from upper management					
Lack of recognition for staying in a job and doing a good job					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Work equipment and environment	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Unstable computer systems					
Incompatible computer systems					
Computer systems are not user-friendly					
Computer systems inability to perform certain features					
Limited time to learn new systems					
Limited training in new systems					
Lack of thoroughness in training in using new systems					
Office layout of grey modules					
Lack of facilities available for breaks away from work area					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Example:
Key: (0) Problematic (1) Neither problematic nor good (2) Good
If you think a high workload is problematic tick box 0

Getting the work done	NA	0 P	1 NP/ NG	2 G	Priority 1-3
A high workload		√			

Social climate and interpersonal relations	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Amount of support from team members					
Quality of support from team members					
Amount of support from supervisors					
Quality of support from supervisors					
Amount of support from management					
Quality of support from management					
Opportunities for interaction with staff from many different areas					
Level of communication between teams in [redacted]					
Level of communication between areas					
Quality of co-operation between teams in [redacted]					
Quality of co-operation between areas					
Dependency on other teams to complete my task					
Difficulties communicating with contractors					
Turnover of staff of contractors influencing my interaction with contractors					
Length of time management takes to make decisions					
Late changes made by management or other teams					
Quality of decision making					
Lack of opportunities to co-operate and learn from others when working with CAD					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Home/work interface	NA	0 P	1 NP/ NG	2 G	Priority 1-3
Fitting in social activities outside work					
Fitting family life around working hours					
Support from colleagues about home responsibilities					
Support from management about home responsibilities					
Fitting in family life when stationed abroad					
Opportunities to take family when stationed abroad					
Opportunities to combine travelling and home life					

If you have any further comments or practicable suggestions to how problems may be improved, please write them here.....
.....

Key personnel

Please indicate (with a tick in the box provided) which sources of support you would consider using to discuss **personal work-related problems** (e.g. coping with the demands of the job).

Source of help	**Use (√)**
Supervisor	
[redacted] manager	
Personnel	
Occupational Health Department	
Training	
[redacted]	
[redacted]	
Union representative	
Colleagues	
Former colleagues	
Former colleagues who have been promoted	
Former supervisors	
Friends	
Family	
GP	

If you have any further comments, please write them here.....
.....
.....

TEAM CHARACTERISTICS

The following questions are about how closely your team needs to work together in order to get the work done. We would like to answer the same questions looking at both your functional supervisor team and the department.

For the following questions please tick the box, which most accurately reflects your view. The first section asks you to state the degree to which your team depends on you to get their work done. The scale ranges from 1 to 5 from completely independent to completely dependent with 1 equals completely independent and 5 equals completely dependent.

Functional supervisor team

1 C/I	2	3	4	5 C/D	Extent to which colleagues depend on you	1 C/I	2	3	4	5 C/D
					To what extent do your team colleagues depend on you for information and advice?					
					To what extend do your team colleagues depend on you for materials, means, and other things they need?					
					To what extent do your team colleagues depend on your presence, help, and support?					
					To what extent do your team colleagues depend on you for doing their work well?					

Functional supervisor team

1 C/I	2	3	4	5 C/D	Extent to which you depend on colleagues	1 C/I	2	3	4	5 C/D
					To what extent do you depend on your team colleagues for information and advice?					
					To what extent do you depend on your team colleagues for materials, means, and other things you need?					
					To what extent do you depend on the presence, help and support of your team colleagues?					
					To what extent do you depend on your team colleagues for doing your work well?					

This section of questions concerns whether you and your colleagues depend on each other for attaining the outcome of your work. Please rate your response with 1 indicating that you depend very much on your colleagues for attaining the outcome of your work and 7 indicating that you do not depend on your colleagues for attaining the results. (E.g. if it benefits you to a high degree when your colleagues in the team attain their goals tick 1, or if it hinders you to a very high degree if your colleagues in the team attain your goals, tick 7.)

Functional supervisor team

1 D	2	3	4	5	6	7 -D	Outcome interdependence	1 +D	2	3	4	5	6	7 -D
							It (benefits/hinders) me when my team colleagues attain their goals							
							The things my team colleagues want to accomplish and the things I want to accomplish are (compatible/ incompatible)							
							It is (advantageous/disadvantegeous) for me when my team colleagues succeed in their job							
							When my team colleagues succeed in their jobs, it is at my (expense/benefit)							
							My concerns for those and those of my team colleagues are (harmonious/clashing)							
							When my team colleagues succeed in their jobs, it works out (positively/negatively) for me							

TEAM CLIMATE

The following section is about how you and your team work together. Each statement is followed by a scale from 1-5, please tick the number representing your response (with 1 being 'not at all' and 5 being 'completely').

Functional supervisor team [redacted]

1 N/A	2	3	4	5 C	Vision	1 N/A	2	3	4	5 C
					How far are you in agreement with your team objectives?					
					To what extent do you think your team's objectives are clearly understood by other members of the team?					
					To what extent do you think your team's objectives can actually be achieved?					
					How worthwhile do you think these objectives are to the organisation?					

In this section please respond by ticking the appropriate box reflecting the degree to which you agree with the following statement (with 1 being 'strongly disagree' to 5 being 'strongly agree').

Functional supervisor team [redacted]

1 S/D	2	3	4	5 S/A	Team Support	1 S/D	2	3	4	5 S/A
					We have a 'we are together' attitude					
					People keep each other informed about work-related issues in the team					
					People feel understood and accepted by each other					
					There are real attempts to share information throughout the team					

In this section please indicate the extent to which this is happening in your team (with 1 being 'to a very little extent' and 5 being 'to a very great extent').

Functional supervisor team [redacted]

1 S/D	2	3	4	5 S/A	Task orientation	1 S/D	2	3	4	5 S/A
					Are team members prepared to question the basis of what the team is doing?					
					Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?					
					Do members of the team build on each other's ideas in order to achieve the best possible outcome?					

In this section please respond by ticking the appropriate box reflecting the degree to which you agree with the following statement (with 1 being 'strongly disagree' to 5 being 'strongly agree').

Functional supervisor team [redacted]

1 S/D	2	3	4	5 S/A	Support for innovation	1 S/D	2	3	4	5 S/D
					People in this team are always searching for fresh, new ways of looking at problems					
					In this team we take the time needed to develop new ideas					
					People in the team co-operate in order to help develop and apply new ideas					

YOUR HEALTH: THE GENERAL WELL-BEING QUESTIONNAIRE

This section is to do with your general health. It is directly relevant to measuring the effects of work. Please read each of the questions carefully and decide how often, **over the last six months,** you have experienced the various symptoms that are listed. Please circle just one point on each response scale (from **All the time** to **Never**). We would like you to answer all the questions so that we can score the questionnaire fully.

Over the last six months, how often have you...		**All the time**	**Often**	**Some times**	**Rarely**	**Never**
1.	Been bothered by your heart thumping?	4	3	2	1	0
2.	Become easily bored?	4	3	2	1	0
3.	Experienced loss of sexual interest or pleasure?	4	3	2	1	0
4.	Become easily annoyed or irritated?	4	3	2	1	0
5.	Had to clear your throat for no apparent reason?	4	3	2	1	0
6.	Been scared when alone?	4	3	2	1	0
7.	Got mixed up in your thinking when you have had to do things quickly?	4	3	2	1	0
8.	Broken out in a rash when you have been upset or excited?	4	3	2	1	0
9.	Shaken or trembled for no apparent reason?	4	3	2	1	0
10.	Done things rashly or on impulse?	4	3	2	1	0
11.	Thought people considered you a nervous person?	4	3	2	1	0
12.	Been forgetful?	4	3	2	1	0
13.	Found things getting on your nerves and wearing you out?	4	3	2	1	0
14.	Become afraid of unfamiliar places or people?	4	3	2	1	0
15.	Become easily tired?	4	3	2	1	0
16.	Become flushed / hot in the face for no apparent reason?	4	3	2	1	0
17.	Experienced numbness or tingling in your arms or legs?	4	3	2	1	0
18.	Had difficulty in falling or staying asleep?	4	3	2	1	0
19.	Been tense or jittery?	4	3	2	1	0
20.	Found your feelings easily hurt?	4	3	2	1	0
21.	Had any pains in the heart or chest?	4	3	2	1	0
22.	Been troubled by stammering?	4	3	2	1	0
23.	Found it hard to make up your mind?	4	3	2	1	0
24.	Worn yourself out worrying about your health?	4	3	2	1	0

Are there any particular, well-defined work situations, which make you very anxious or agitated?
If YES, please specify

.....

.....

.....

Overall, how satisfied are you with your job?
(circle one number on the scale below)

Not at all Satisfied			Very Satisfied
1	2	3	4

How would you rate your workload?
(circle one number on the scale below)

Far too little to do			Far too much to do
1	2	3	4

Which of the following statements most accurately reflects your views about leaving or staying in your job?
(please tick the appropriate box)

☐ I would leave [redacted] and [redacted] as soon as the opportunity arose

☐ I would leave [redacted] as soon as the opportunity arose, but like to continue to work within [redacted]

☐ I would leave [redacted] as soon as the opportunity arose, but like to continue to work within [redacted]

☐ I wish to continue to work in [redacted]

What would tempt you to leave and ideally where would you like to go (within the company or outside)?

.....

.....

Please estimate how many days and spells of *sickness-related* absence you have had from work in the last 12 months

.....days .....spells

In addition, please estimate how much *non-sickness-related* absence you have had from work in the last 12 months.

.....days .....spells

Appendix 2:

Risk Assessment Survey in Case Study B

Case Study B

Stress Management Project
Staff Survey

[redacted] has commissioned the Institute of Work, Health & Organisations, as independent experts in occupational health psychology, to carry out a risk assessment for work-related stress in different sections of your company. The aim of this project is to identify the risk factors for stress that exist in the design, organisation and management of work, and use these as a basis for developing actions to reduce work-related stress. The project will take place in different sections of the company at differing times throughout the year.

We have successfully conducted this evidence-based and preventive approach to stress management in many large organisations. Last year, a similar project was carried out in parts of [redacted]. Action plans to reduce stress are currently being developed and implemented following on from the survey there.

The aim of the survey is to elicit your views about the design, organization and management of your work, the problems you face, and whether you think that those factors affect your general health and welfare. We are particularly interested in your experience of work-related stress.

In order to make full use of the results of this survey, particularly in relation to the development of effective improvements, it is very important that we obtain information from all staff. A 100% response rate would be ideal. Furthermore, the more honest and accurate your replies to our questions, the more useful the information will be. This is an important opportunity to provide information relevant to your job, health and welfare, and an opportunity for your managers to listen and make improvements.

We would like to assure you that we are entirely independent and that what you write on the survey form will *only* be read by members of our team. No individual questionnaires will be read by anyone from [redacted]. Furthermore, the questionnaires are anonymous and we will not identify any individual. Our focus is on the nature of work in [redacted] and its likely impact on staff health and welfare.

We know you are very busy but we hope you can find the time to complete the form, which should take approximately 20 minutes. **Please return your completed form to [redacted] at the Institute of Work, Health and Organisations, University of Nottingham, Jubilee campus, Wollaton Road, Nottingham, NG8 1BB, UK** or by mail to [redacted]. If you have been away on holiday or business and have missed this date, please still complete and return the form, it will be of use to the project.

The Final Report will be submitted to the group once completed and discussions will then take place to develop interventions based on the findings of this risk assessment survey.

Thank you for your help.
Professor Tom Cox
Dr Amanda Griffiths
Dr Louise Thomson
Ms Joanna Pryce
Ms Stavroula Leka

Institute of Work, Health & Organisations
Nottingham, January 2001

SECTION 1: YOU AND YOUR JOB

1. Gender: ☐ Male ☐ Female
2. Age: ☐
3. National status: ☐ Expatriate ☐ Non-expatriate
4. Number of years working for [redacted]: ☐
5. Number of years working in [redacted] ☐
6. Department: ☐
7. Salary Group: ☐ [redacted] ☐ [redacted] ☐ [redacted]
8. Type of Contract: ☐ Full-time ☐ Part-time
9. How many hours per week are you *contracted* to work? ☐
10. On average, how many hours per week do you *actually* work?
    ☐ total ☐ at home ☐ in office ☐ away on business
11. How many hours per week do you think are actually necessary to complete the important core / billable aspects of your job ? ☐
12. On average, how many times a year do you travel abroad with work? ☐
13. How satisfied are you with your job ? *(circle one number on the scale presented below)*

    Not at all satisfied 1 2 3 4 5 Very satisfied
14. How would you rate your workload? *(circle one number on the scale presented below)*

    Far too little to do 1 2 3 4 5 Far too much to do
15. How would you rate the control that you have over your job?

    Very little 1 2 3 4 5 A great deal
16. How would you rate the support that you receive from your colleagues at work?

    Very little 1 2 3 4 5 A great deal
17. How would you rate the support that you receive from your line managers at work?

    Very little 1 2 3 4 5 A great deal

SECTION 2: ASPECTS OF YOUR JOB

We recognise your knowledge and expertise in relation to your own work and that of your close colleagues. We would like you to make 'expert judgements' as to the adequacy or inadequacy of different aspects of that work. For each item below, please tick the column which most accurately reflects your views about **your** job. Because there are such a wide variety of staff in [redacted], some of the aspects of work below may not apply to your job, in which case you should tick the 'NA' column.

KEY:

[NA] Not Applicable or Not Aware
[1] Completely inadequate / a major problem
[2] Inadequate / a minor problem
[3] Not a problem
[4] Good / satisfying aspect of work
[5] Excellent / very satisfying aspect of work

2.1 Work Design	NA	1	2	3	4	5
Constant level of high workload						
Number of tasks you have to do concurrently						
Amount of monitoring of your workload by leaders/coaches						
Prioritisation and planning of tasks by your coach / leader						
Availability of information to enable you to prioritise tasks						
Number of additional/non-billable tasks and roles you have						
Time spent doing clerical tasks (eg faxing, photocopying)						
Time spent dealing with unpredicted issues (ie. 'firefighting')						
Time available to complete core / billable tasks						
Time available for additional / non-billable tasks						
Number of immediate demands from coaches / leaders						
Number of immediate demands from clients						
Number of other people involved in you meeting deadlines						
Flexibility of deadlines from your coach						
Flexibility of deadlines from leaders						
Number of non-essential meetings you have to attend						
Amount of control you have over your attendance at meetings						
Amount of meaningful time you contribute to a meeting						
Number of requests for data from parts of the organization						
Influence of scorecards on your departmental work priorities						
Influence of scorecards on individual behaviour						
Regularity of appraisal meetings with your coach						
Recognition from your coach for completing your core/billable tasks						
Appreciation of your efforts by the organization						
Opportunities to use your skills						
Amount of control your unit / department has over its operations						
Amount of control you have over your tasks						

2.2 Organisational Issues

	NA	1	2	3	4	5
Impact of globalisation on your workload						
Impact of globalisation on your working hours						
Impact of Profit & Loss on your working hours						

KEY:

[NA] Not Applicable or Not Aware
[1] Completely inadequate / a major problem
[2] Inadequate / a minor problem
[3] Not a problem
[4] Good / satisfying aspect of work
[5] Excellent / very satisfying aspect of work

	NA	1	2	3	4	5
Awareness of organisational structures and roles						
Recognition of the local context to your work						
Clarity of your long-term goals and objectives						
Clarity of management vision and objectives						
Stability of management long-term vision						
Quality of direction from your coach						
Accessibility of your coach						
Regularity of team meetings						
Communication and support from managers						
Communication between teams in your department						
Communication with teams outside your department						
Communication between US and Netherlands						
Approachability of the management						
Communication and support from coaches						
Integrity of statements and actions of the leadership team						
Amount of trust you have in your leaders						
Amount of trust you perceive your leaders have in you						
Clarity of signals / expectations from leaders about acceptable working hours / practices						
Number of initiatives which lead to changes in your work						
Communication of reasons for introducing such changes						
Amount of consultation prior to the introduction of changes						
Amount of control you have over the implementation of changes						

2.3 Role at Work	NA	1	2	3	4	5
Clarity of your own roles and responsibilities						
Knowledge of other people's roles and responsibilities						
Conflicting/overlapping priorities of teams and departments						

2.4 Work Equipment & Environment	NA	1	2	3	4	5
Reliability of computer systems and servers						
Availability of ergonomically designed office equipment						
Workability of open plan offices						
Availability of video conferencing equipment						

KEY:

[NA] Not Applicable or Not Aware
[1] Completely inadequate / a major problem
[2] Inadequate / a minor problem
[3] Not a problem
[4] Good / satisfying aspect of work
[5] Excellent / very satisfying aspect of work

2.5 Work Organisation	NA	1	2	3	4	5
Staffing levels in your team						
Number of computer support staff for your team						
Number of administration support staff for your team						
Number of technical support staff for your team						
Length of your average working day						
Number of times you have to work in the evening						
Number of times you have to work at weekends						
Leders'/coaches' expectations of you to work additional hours						
Colleagues' expectations of you to work additional hours						
Others' respect for your work patterns / schedules						
Arranging and taking annual leave						
Amount of business travel you do						
Arranging and taking rest breaks after inter-continental travel						
Amount of time you spend commuting						

2.6 Career, Job Status and Pay	NA	1	2	3	4	5
Job security						
Guidance and mentoring on career development for staff						
Coaching or mentoring for new staff						
Guidance on training and development opportunities						
Fairness of bonuses						
Fairness of basic pay level						
Opportunities to progress within [redacted] whilst remaining in UK						
Opportunities to progress within [redacted] globally						
Effectiveness of the progression system for recruiting people						
Effectiveness of the progression system for finding new posts						
Effectiveness of progression system						
Opportunities to relocate to other countries if you want to						
Procedures to support relocation to other countries						

2.7 Working Climate	NA	1	2	3	4	5
Appreciation of different working practices in different countries						
Level of concern from leaders towards staff well-being						
Level of concern from coaches towards staff well-being						

2.8 Additional Information

Are there any work **problems which have not been mentioned** above ?

Overall, what do you consider to be the **main problems** you face at work that cause you to feel stressed?

1.

2.

3.

Can you suggest **one major change** that would really improve your work by reducing the level of stress involved?

What are the really good and satisfying aspects of your work ? (your main sources of job satisfaction)

SECTION 4: WORK - LIFE BALANCE

Please indicate the extent to which you agree or disagree with the following statements, by circling the appropriate number.

	Strongly Agree				Strongly Disagree
After work, I come home too tired to do some of the things I'd like to do	1	2	3	4	5
The most important things that happen to me involve my job	1	2	3	4	5
I have so much work to do that it takes away from my personal interests	1	2	3	4	5
I live, eat and breathe my job	1	2	3	4	5
My family / friends dislike how often I am preoccupied with my work while I am at home.	1	2	3	4	5
I am very much involved personally with my work	1	2	3	4	5
My work takes up time that I'd like to spend with my family and friends	1	2	3	4	5
The major satisfaction in my life comes from my job	1	2	3	4	5

SECTION 4: TEAM WORKING & DEVELOPMENT

1. Where are the members of your team based? ❑ [redacted] ❑ [redacted] ❑ [redacted]

2. How often does your whole team hold meetings?

❑ Every day ❑ Every week ❑ Every month ❑ Less than once a month

Please indicate the extent to which you agree or disagree with the following statements, by circling the appropriate number.

	Strongly Agree				Strongly Disagree
In my team we work on a joint task	1	2	3	4	5
I often learn by the experiences I get from my work	1	2	3	4	5
The management reacts positively to views and suggestions put forward by me or my colleagues	1	2	3	4	5
My managers respect my skill and knowledge	1	2	3	4	5
As a team we are responsible for completing a specific well-defined task	1	2	3	4	5
I have an inclination to see things in a new way and look upon myself as innovative	1	2	3	4	5
I depend on others to complete my tasks.	1	2	3	4	5
My experiences are used well by the organisation	1	2	3	4	5
Working within the team, I develop new ideas for work	1	2	3	4	5
Others depend on me to complete their tasks.	1	2	3	4	5
My managers encourage learning	1	2	3	4	5
The management quickly responds to suggestions and uses them	1	2	3	4	5
As a team we decide which methods and procedures to use when carrying out tasks	1	2	3	4	5
Within my team we allocate responsibility for specific elements of the task among members of the team.	1	2	3	4	5
I feel as though I am constantly developing in my work	1	2	3	4	5
My colleagues often ask my advice	1	2	3	4	5
The management are open for new ways of thinking and creativity	1	2	3	4	5
I learn from my work	1	2	3	4	5
Constant change at work requires learning new things all the time	1	2	3	4	5
Working with the managers, I develop new ideas	1	2	3	4	5

SECTION 5: YOUR HEALTH & WORK-RELATED BEHAVIOUR

WORK-RELATED MUSCULO-SKELETAL PAIN

1. Have you experienced any **muscle/ligament/tendon/joint discomfort or pain** that you think was caused or **made worse by your work** over the last 12 months? ☐ YES ☐ NO

2. Where was this discomfort or pain located?

3. What particular aspects of your work do you think contributed to this pain or discomfort?

YOUR GENERAL WELL-BEING

This section is to do with your general health. It is directly relevant to measuring the effects of work. Please read each of the questions carefully and decide how often, **over the last six months,** you have experienced the various symptoms that are listed. Please circle just **one** point on each response scale (from **All the time** to **Never**). We would like you to answer all the questions so that we can score the questionnaire fully.

Over the last six months, how often have you...		**All The Time**	**Often**	**Some Times**	**Rarely**	**Never**
1.	Become easily bored?	4	3	2	1	0
2.	Become easily annoyed or irritated?	4	3	2	1	0
3.	Had to clear your throat for no apparent reason?	4	3	2	1	0
4.	Got mixed up in your thinking when you have had to do things quickly?	4	3	2	1	0
5.	Done things rashly or on impulse?	4	3	2	1	0
6.	Been forgetful?	4	3	2	1	0
7.	Found things getting on your nerves and wearing you out?	4	3	2	1	0
8.	Become easily tired?	4	3	2	1	0
9.	Become flushed / hot in the face for no apparent reason?	4	3	2	1	0
10.	Had difficulty in falling or staying asleep?	4	3	2	1	0
11.	Found your feelings easily hurt?	4	3	2	1	0
12.	Found it hard to make up your mind?	4	3	2	1	0

Thank you for your co-operation.