# DOCTOR OF PHILOSOPHY

# Team effectiveness: a test of in-put process-output

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TEAM EFFECTIVENESS: A TEST OF INPUT- PROCESS- OUTPUT MODEL

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# ABSTRACT

This research addressed the question: "Which factors predict the effectiveness of healthcare teams?" It was addressed by assessing the psychometric properties of a new measure of team functioning with the use of data collected from 797 team members in 61 healthcare teams. This new measure is the Aston Team Performance Inventory (ATPI) developed by West, Markiewicz and Dawson (2005) and based on the IPO model. The ATPI was pilot tested in order to examine the reliability of this measure in the Jordanian cultural context. A sample of five teams comprising 3-6 members each was randomly selected from the Jordan Red Crescent health centers in Amman. Factors that predict team effectiveness were explored in a Jordanian sample (comprising 1622 members in 277 teams with 255 leaders from healthcare teams in hospitals in Amman) using self-report and Leader Ratings measures adapted from work by West, Borrill et al (2000) to determine team effectiveness and innovation from the leaders' point of view.

The results demonstrate the validity and reliability of the measures for use in healthcare settings. Team effort and skills and leader managing had the strongest association with team processes in terms of team objectives, reflexivity, participation, task focus, creativity and innovation. Team inputs in terms of task design, team effort and skills, and organizational support were associated with team effectiveness and innovation whereas team resources were associated only with team innovation. Team objectives had the strongest mediated and direct association with team effectiveness whereas task focus had the strongest mediated and direct association with team innovation. Finally, among leadership variables, leader managing had the strongest association with team effectiveness and innovation.

The theoretical and practical implications of this thesis are that: team effectiveness and innovation are influenced by multiple factors that must all be taken into account. The key factors managers need to ensure are in place for effective teams are team effort and skills, organizational support and team objectives. To conclude, the application of these findings to healthcare teams in Jordan will help improve their team effectiveness, and thus the healthcare services that they provide.

**Key Words:** ATPI, Team effectiveness, Jordanian Health Care.

# ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION TO THE RESEARCH


The purpose of this chapter is to explain why research on teamwork is important, particularly in relation to hospitals and what this specific research aims to achieve. To do this, the chapter will consider why the number of organizations embracing teamwork is increasing and therefore why it is necessary to measure teams' effectiveness. The chapter will discuss the objectives of the research and the context in which it is being conducted, namely in relation to the Jordanian healthcare system. In addition, the overall structure of the thesis will be outlined.

## 1.1 Teamwork Today: its Rise in Usage and Research

Over the last two decades a variety of global forces have pushed organizations worldwide to restructure work around teams and as a result teams have become the building blocks of many contemporary organizations (Kozolowski & Ilgen, 2006; Stewart & Barrick, 2000). Many scholars see the changing global environment as the catalyst for organizations' adoption of team working since it has increased market rivalry - creating a greater need for innovation – as well as diversity in the workplace (French & Bell, 2000; De Dreu, 2007). When a structure becomes more complex; there is an increased urgency for a group of people to coordinate their work in order to accomplish goals that will satisfy the overall aims, effectiveness and competitiveness of the organization (West, Borrill & Unsworth, 1998; Borrill et al., 2000).

This recent shift towards teamwork is evident as there are estimates that 80% of companies with 100 or more employees rely on teams and groups for their everyday work (Peterson, Mitchell, Thompson, & Burr, 2000; Cohen & Bailey, 1997). Offerman and Spiros (2001) found that managers spend almost 40% of their time working with teams or groups, and almost 50% of these managers report that the demand for team development will increase. Fiore, Salas and Cannon-Bowers (2001) reported that 80% of service workers are currently members of at least one team and this estimate will continue to increase in step with evolving environmental complexities. Cohen, Ledford and Spreitzer (1996) highlight the findings of the US *Fortune* magazine, that 47% of 1000 enterprises in 1990 used work teams, compared to 28% in 1987. According to Lawler, Mohrman and Ledford (1995), 68% of the *Fortune* 1000 companies have adopted the mechanism of teamwork. Beyerlein and Harris (1998) noted that in 80% of organizations with over 100 employees, 50% of their employees are at least part of one team.

Scholars have identified many reasons why teamwork is being adopted, most of which focus around efficiency: French and Bell (2000) argue that teams are adopted to reach a high level of efficiency and effectiveness and to enable more rapid, flexible and adaptive responses to the unexpected. Several other scholars also focus on the flexibility and adaptability of teams while also highlighting the benefits of concentrating authority and structuring activities that teamwork creates (Piña, Martínez & Martínez, 2007; Stewart & Barrick, 2000).

McComb, Green, and Compton (1999) state that the combination of skills, expertise, and resources of team members enable teams to potentially

optimize the speed and efficiency in which complex tasks can be completed. Cohen et al. (1996) argue that the main reasons for organizations to develop team functioning is that it is effective and can provide organizational benefits such as the improvement of performance, productivity, and employee satisfaction. Teams can also promote organizational efficiency, including learning efficiency, innovation capability, information processing, cost and time effectiveness, increased service quality, monitoring and coordination and reduced employee absenteeism (Cantu, 2007; Mohrman et al., 1995; Austin, 2003 and Leggat, 2007). Cantu (2007) and West, Borrill and Unsworth (1998) focus on the fact that teams can achieve more and that they make better decisions due to their wider range of knowledge and skills, increased communication and better flow of information. Indeed, when they are part of decision making, staff members feel more committed to reaching a solution.

With this clear rise in the adoption of teamwork and the shift to flatter structures in organizations, team effectiveness has become a salient organizational concern and thus its importance as a research topic has correspondingly increased. As a result, many studies have been conducted on team effectiveness, analyzing its different components and dimensions, and the means to measure them and research what particularly influences team effectiveness. Previous studies have focused on merely describing group dynamics, while more recent research has focused on giving practical advice on increase team effectiveness through factors such as team task design and team composition (Bell, 2007). Studies on this subject have arrived at different conclusions and findings, and some dealt with teams' positive or negative

impact (e.g. Carter et al.(unpublished); Bell, 2007; Jordan et al., 2002; Stewart, 2006; Leach et al., 2005; Passos & Caetano, 2005; De Dreu & Van Vianen, 2001; Campion et al., 1993; Campion et al., 1996; Shea & Guzzo, 1987; Bligh, Pearce & Kohles, 2006; Bell, 2007). Several research models have been developed to measure team effectiveness many of which adopt the model (IPO) initially applied to groups by McGrath (1964) and subsequently refined by Hackman and Morris (1975).

Having discussed the importance of teamwork in general, attention must now be drawn to the importance of healthcare in societies and the importance of teams for providing healthcare since this will be the focus of the studies in this research. Healthcare delivery has also changed dramatically worldwide over the last two decades and is one of the most important service-oriented sectors and a development indicator in any country (Dunn et al., 2005; Mrayyan, 2007). It is hugely important in society for health and as a percentage of GDP: in 2006 the United Kingdom's healthcare expenditure was estimated at 8.4% of GDP (Expenditure on Healthcare in the UK, 2008), while in 2006 the Jordanian healthcare expenditure comprised approximately 9.0% of GDP (MOH, 2006). The importance of the healthcare sector stems from the fact that when a good health service is in place, people do not exhibit concern about their children's or their own health and hence are able to work more effectively and be more productive (MOH, 2006).

Healthcare professionals must coordinate their activities to make patient care as safe and efficient as possible across the different disciplines, whether physicians, nurses, pharmacists or technicians (Borrill et al, 2000). They must

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also share the common goal of limiting errors, establishing clear objectives and being constantly adaptive as medical knowledge and medical technology advance. This is in order for their teams to function with increasing effectiveness. Effective teamwork within UK hospitals has been shown to reduce staff stress, improve job retention, increase cost-effectiveness and generate innovation (Borrill et al, 2000). It is for these reasons that it is important to study the effectiveness of healthcare teams in Jordan, and this, therefore, will be the focus of the third study of this research.

## 1.2 Purpose of the Research

The main question for this research is "which factors predict the effectiveness of healthcare teams?" There are four subsidiary research objectives:

1. To determine the psychometric properties of a survey instrument designed to (relatively comprehensively) assess the main dimensions of team working and team effectiveness. This measure is the Aston Team Performance Inventory (ATPI) developed by West, Markiewicz & Dawson (2005) and based on the inputs, processes and outputs model.

2. To pilot test the ATPI in order to examine the reliability of this measure in the Jordanian context.

3. To determine which aspects of healthcare team inputs and processes predict team outputs and whether the relationships between team inputs and outputs are mediated by processes.

4. To practically contribute to the knowledge and understanding on how best to improve healthcare and team functioning.

To the best available knowledge, this is the first application and testing of the ATPI measure outside the UK. This research is the first of its kind to examine healthcare team effectiveness in a Middle Eastern setting. It will contribute to the literature significantly. It will introduce a new measure for team effectiveness in organizations especially those in the healthcare sector. Its importance can be divided into theoretical and practical elements:

The theoretical contributions of the research include determining which inputs are most powerful in predicting processes and outcomes in healthcare teams, which processes within them are most powerful in predicting outcomes and whether and what processes mediate input-output relationships. Meanwhile, the practical importance of the research is that through identifying which team inputs and processes are most powerful in predicting team effectiveness in hospitals in Amman, clear feedback can be provided to hospital managers in relation to their teams' effectiveness, useful information disseminated to many concerned individuals and organizations, including planners and legislators, and researchers provided with some feedback regarding the subject. In addition, it is the first use of the ATPI measure in a Middle Eastern setting and therefore will be useful for developing a measure that can be applied in this region for similar future research.

Three studies were undertaken in order to achieve the research objectives. Study one was an analysis of the psychometric properties of the ATPI measure. This utilised secondary data which was collected by the Institute of Health Services Effectiveness at Aston Business School between 2003 and 2006. The study sample consisted of 797 team members in 61 healthcare

teams which responded to the ATPI English version questionnaire. To measure the validity of the ATPI measure, this study used Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA is used to detect unknown factor structures and to refine measures in scale development, while CFA is used to test the fit of a hypothesized factor structure to observed data (Conway & Huffcutt, 2003).

The second study was conducted in five healthcare centers at Jordan Red Crescent. A sample of five teams, comprising 3-6 members each, was randomly selected to pilot test the ATPI and in the meantime to generate a value understanding of how to a healthcare team's effectiveness could be improved. This study also aimed to test a measure of service quality to determine the quality of healthcare given to the Iraqi patients in a Jordanian healthcare context. A sample of 1652 service users was used for this purpose.

The third study was conducted in 36 Jordanian public, private and military hospitals based in Amman. The study sample consisted of 1622 team members in 277 teams responding to the questionnaire. Two measures of team effectiveness were used:

1. ATPI was used to measure the team functioning from team members' point of view.

2. The Leader Ratings measure, adapted from work by West, Borrill et al, (2000), was used to determine team effectiveness from the leaders' perspective in the Jordanian setting.

These two measures were adapted to the Jordanian context by two means: firstly, translation into Arabic to produce instruments that are culturally

appropriate; secondly, through cognitive interviews. The translated questionnaires were given to experts in this field to explore the Jordanian understanding of the concept of team and team effectiveness. Then a sample from the target number was used as a pre-test to measure the reliability of these measures in the Jordanian context (study two). CFA is used to ensure the strength of the factor structure of the ATPI's Jordanian version dimensions.

## 1.3 The Jordanian Context

To help understand the implications of this research, it is important to consider the context in which the study is set, both in terms of Jordan as a country and in terms of its healthcare system. Jordan is a small Arab country in the Middle East with limited water resources and inadequate natural resources such as oil and coal. However, Jordan benefited from increased Arab aid during the oil boom of the late 1970s and early 1980s when its annual real GNP growth averaged more than 10% (US-E&SD, 1994). In the remainder of the 1980s, reductions in both Arab aid and worker remittances slowed real economic growth to an average of roughly 2% per year. In mid-1989 the Jordanian Government began debt-rescheduling negotiations and agreed to implement an IMF-supported program designed to gradually reduce the budget deficit and implement badly needed structural reforms (ETF, 2000).

The Gulf Crisis that began in August 1990 aggravated Jordan's already serious economic problems. Reduced aid from Gulf Arab states and workers' remittances, in addition to the influx of refugees, produced serious balance-of-payments problems. This, in turn, stunted GDP growth and strained government resources. The economy rebounded in 1992, largely due to the influx of capital

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repatriated by workers returning from the Gulf but recovery was uneven between 1994 and 1997. The government is still implementing the reform program adopted in 1992 and continues to secure rescheduling and write-offs of its heavy foreign debt (ETF, 2000); as a result economic growth continues to improve. However, despite these economic developments, the recent Iraq war has had a further impact on Jordan, the surge of incoming refugees prompting rapid population growth and pressuring Jordan's front-line services, especially its health services. This strain makes the need for efficiency even more important, and thus the value of this research will be widely felt (World Trade Organization, 2008).

Healthcare in Jordan is provided by three sectors: the public, the private and the military. In the past however, the public sector was the main provider of health services but due to the governmental privatization policies and the national health strategy, the private sector was encouraged to enter into the health field. The participation of the private sector in providing health services to Jordanians has increased significantly. In 1986 there were 28 private sector hospitals; by 1996 it was 42, in 1996 the number stood at 46 and rose to encompass 60 hospitals in 2008 (MOH, 2008). The introduction of so many private hospitals has created a competitive environment in terms of service, quality and charges. Hospitals seek to retain the loyalty of their patients, who are largely wealthy and working in the private sector (MOH, 2008 & Mrayyan, 2007). The 2006-2010 National Health Strategy aims to improve and promote the health of all Jordanian citizens by offering them an efficient and effective

healthcare system, and by raising the competence of its employees and their commitment to teamwork.

Each of the healthcare sectors has its own financing and delivery system. The Ministry of Health (MOH) owns and operates 30 non-profit general and specialized hospitals out of 103 hospitals in 11 governorates, with 4333 out of 11200 hospital beds accounting for 38.6% of total hospital beds in Jordan. The bed occupancy rate in MOH hospitals was 65.1 % for the year 2008 (MOH, 2008). In 2007 and 2008 the MOH budget accounted for 5.56% and 7.02 % of the general budget respectively (MOH, 2008). In addition to its general public health functions, the MOH has a dual financing function: it is also responsible for administering the Civil Health Insurance Plan (CHIP) which covers civil servants and their dependents (National Health Strategy, 2006/2010).

Despite adverse conditions in Jordan's past, increased prosperity has been the trend of the last 40 years and, as a result, Jordan has quite an advanced healthcare system (Library of Congress, 2006). At the end of the Twentieth Century, due to modern technology and its open policy in respect to economic and security issues, Jordan witnessed rapid development. It is now well ahead of its neighbours in the Middle East and North Africa region in terms of vital health indicators and modern healthcare infrastructures (World Trade Organization, 2008).

In 2008 the total expenditure on health was 9.6 % of GDP and the general government expenditure on health was 8.7% of total government expenditure (World Health Organization, 2009). The average annual population growth rate was 2.2%, the infant mortality rate 19/1000 live births and life

expectancy at birth for males was 71.6 years and for females 74.4 years. In the same year the number of physicians/10000 population(pop) rose to 24.9, dentists/10000pop to 8.7, pharmacists/10000pop to 13.2, nurses (all categories)/10000pop to 33.2. As a result of these developments Jordan has gained a competitive advantage and has become a health center attracting citizens from neighboring and regional countries (MOH, 2008; World Trade Organization, 2008).

Due to Jordan's reputation in the region and as a result of the demand for services, many private and public hospitals have opened across Jordan. In their search to deliver high quality medical services, these hospitals have acquired the latest technological equipment, recruited the most renowned and competent specialists from the Arab world and adopted and implemented Total Quality Management (TQM) programs in order to remain competitive with other hospitals. The management in these hospitals have also adopted team-based working to deliver medical services and achieve a competitive advantage (Ministry of Health Annual Report, 2008).

As a result the National Health Strategy (2006/2010) in Jordan aimed to raise staff commitment to the spirit of teamwork and hospitals established several teams such as operation teams and emergency teams. They also went further and established crisis teams which could act if there was an increase in the demand on the health services. Hospital managers formulated these teams based on the competence and effectiveness of the members which would impact the effectiveness of their hospitals in general. There are five divisions of labour in hospitals which contribute to interdisciplinary teams: Physicians, who

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have full authority over the rest of medical staff; nurses who carry out doctors' orders and care for the patients and their demands; technicians; workers who take care of catering, laundry, maintenance etc. and administrators, whose task is to organize, supervise and coordinate the work of all hospital staff (High Health Council Report, 2009).

Meeting the increasing and frequently changing and complex challenges in healthcare the above-mentioned health professionals mentioned above work in partnership with each other, with other professionals such as social services staff, and with patients and carers. In addition, it is expected that the current population (which currently stands at just over 6 million) will double by 2035. This accelerated population growth, along with the transition of diseases and the spread of unhealthy lifestyle patterns in the Jordanian community, will place urgent demands on efficient health care delivery. This is especially so in respect to the elderly and mother and child care (High Health Council Report, 2009). The value of working as a team in this sector has already been recognized in Jordan. However, strategies to strengthen and develop team working within primary healthcare are now needed to secure modern health services in the future.

## 1.4 Structure of the Thesis

The thesis is divided into ten chapters: Chapter Two focuses on distinguishing between the different types of teams and identifying precisely what the benefits of adopting teamwork are, particularly in healthcare organizations. This is followed by a review of what team effectiveness is and which models and predictors of team functioning can be utilised to measure it.

Chapter Three focuses on the significant input, process, and output factors discussed in the previous chapter. It will attempt to determine which factors predict the effectiveness of healthcare teams. Chapter Four presents the hypotheses that are proposed in order to address the main question of this research, namely: "which factors predict the effectiveness of healthcare teams?". Measures of team effectiveness and functioning are reviewed in Chapter Five in order to assess which precise method and measure should be adopted for this research. The remainder of the chapter will present the measures that will be used.

Chapter Six focuses on the methods used to assess the psychometric properties of Aston Team Performance Inventory (ATPI) developed by West, Markiewicz and Dawson (2005). Following on from this, Chapter Seven addresses the cultural adaptation for the ATPI and leader ratings measures that will be used for the purpose of this research, prior to its application to healthcare teams in the Jordanian hospitals. The second study is presented in Chapter Eight with the aim of pilot testing the ATPI. In addition, it will also test a measure of service quality in a Jordanian healthcare context and determine the quality of healthcare delivered to Iraqi patients in Jordan. Chapter Nine tests the psychometrics properties of the research measures based on the data collected from Jordanian healthcare teams, and tests the hypotheses developed to answer the main study question: "Which factors predict the effectiveness of healthcare teams?" Finally, the key findings of this research are presented in Chapter Ten, and the theoretical and practical contributions of the research are discussed.

## 1.5 Conclusion

This chapter illustrated that it is important to study teamwork effectiveness due to the increased usage of teams in organizations as a result of a fast moving, competitive global environment. Research has shown that teams increase the efficiency of organisations as they can improve performance and productivity, reduce costs, increase innovation, learning and employee satisfaction and make an organization more flexible (McComb et al., 1999; Cohen et al., 1996; Mohrman et al., 1995; Austin, 2003 and Leggat, 2007); in summary, adopting teamwork can make organizations much more effective.

Research into teams in healthcare systems is significant as they are universal in the healthcare profession. Their optimum functioning is therefore essential to the delivery of excellent healthcare services. This research in particularly important as it focuses on the effectiveness of teamwork in hospitals in Jordan, something which has not been previously researched, and aims to assess which team inputs and processes are most powerful in predicting team effectiveness in hospitals in Amman.

This is achieved by first of all evaluating the psychometric properties of the ATPI measure in the UK setting it was designed for, then by adapting it to the Jordanian context and conducting ATPI and Leader Ratings measures in 36 Amman hospitals. Through the third study the relationship between team inputs and outputs will be examined and practical advice will be given to hospitals in Amman to improve their team effectiveness.

# CHAPTER 2

## TEAMS AND TEAM EFFECTIVENESS

### 2.1 Chapter Overview

Having established the context in which this research is being conducted and its overall aims, this chapter will focus on defining what a team is, what different types of team exist, and what team effectiveness is, particularly in relation to healthcare teams and organizations. In addition, methods of measuring and predicting team effectiveness will be discussed. Finally, this chapter will clarify the importance of developing a common tool for measuring team functioning.

### 2.2 What is a Team?

Numerous definitions of a team have been posited (Unsworth & West, 2000), all of which focus on slightly different aspects of teamwork. The American Heritage Dictionary of the English Language (2009) offers a very simplistic definition stating that a team is "a group organized to work together". In essence this does describe a team; however a more comprehensive definition is needed. Brannick et al (1997) defined a team as "two or more people with different tasks who work together adaptively to achieve specified and shared goals". While slightly more detailed, this definition is still rather simplistic. A commonly accepted definition of a team is "a collection of two or more individuals who interact interdependently, dynamically and adaptively to achieve a common and valued goal "(Paris et al., 2000). While very similar to the above definition, the emphasis on the interaction between team members

makes this definition slightly more comprehensive. Shea and Guzzo (1987) also highlight the significance of interdependency as a key characteristic of teams.

Hackman (2002) focuses a great deal on the composition of a team rather than the task at hand, stating that team members are truly interdependent in the work that they do; they have clear membership boundaries, implying collective responsibility for task completion; they have specific delimited authority to manage their own work and processes and they have relatively stable membership. Mohrman, Cohen and Mohrman (1995) and Borrill et al. (2002) offer a more useful definition which incorporates details both of the task of a team and the manner in which team members work together. They describe a team as "a group of individuals who work together to produce products or deliver services for which they are mutually accountable" (Borrill, et al (2002), pp. 12). Team members share goals and are held mutually accountable for meeting them. They are interdependent in their endeavours, and their interactions will determine their degree of success. Because the team is held collectively accountable, all members are obliged and responsible to work in an integrated manner.

While the two former definitions are somewhat all-encompassing, a more clearly written definition is offered by Kozolwski and Ilgen (2006) who state that a team can be defined as:

> (a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment. (Kozolwski & Ilgen, 2006, pp.79)

Therefore, due its comprehensiveness and also the fact that it is highly relevant to many different types of team, it is this definition that will be used in this research. This definition can easily be applied to healthcare teams as it is critical for physicians, nurses, technicians and other healthcare professionals to perform specific roles interdependently, in order to improve their community's healthcare in the safest and most effective manner (Baker, Day & Salas, 2006).

## 2.3 Types of Team

Having identified what a team is in general, it is now important to consider what type of team this research will work with as not all team effectiveness measures are useful for all types of teams (Pina, Martinez & Martinez, 2007). Therefore, before the measure can be chosen, the team type must be identified.

Numerous team types have been identified all of which serve different functions and are useful in different contexts. Glenn Parker (2003) categorizes teams into three types:

- The *functional* team which has a clear pyramid like structure in which there is one boss and those who report to that boss.

- The *self-directed* team which can be described as a group of employees who are responsible for either a 'whole' process or a part of a process that delivers a product or service. As well as being responsible for completing their work, the team members are responsible for managing themselves and their work.

- The *cross-functional* or *multidisciplinary* team is made up of individuals from different departments whose different skills are essential for achieving a set goal (Parker, 2003, pp. 2-4).

While these team types are useful, healthcare teams do not really fit into any of them. Salas, Dickinson, Converse, and Tannenbaum (1992) feel that medical teams fall into a category labelled "action teams", which are defined as the teams which "perform some of the most critical work in the global economy". However, this definition is not very precise and is mainly applicable to emergency medical teams rather than all teams. Cohen and Bailey (1997) offer another approach to team classification, identifying four team types:

- *Work* teams: continuing work units responsible for producing goods or providing services, usually well defined and fairly stable groups of full-time workers, often led by a supervisor.

- *Parallel* teams: groups of workers brought together from across an organization, usually to perform advisory functions, targeted at problem solving or improvement activities.

- *Project* teams: team members drawn from different departments or functions on the basis of their expertise (for example cross-functional) in order to focus on a time-limited, often one-off project, such as a new product.

- *Management* teams: comprise of managers from across the organization (for example research and development, marketing and engineering) who coordinate and provide direction for subunits, These may occur at any level, but groups of executives at the most senior level of an organization

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(top management teams) are increasingly formed to make collective decisions (Cohen and Bailey, 1997, pp. 241-243).

The healthcare teams which this research will focus on fits well into the work team category well since they usually consist of one or more families of full time doctors or general practitioners, nurses, health visitors such as midwives and receptionists whose common goal is to maintain and improve health services in the local population. This is achieved through continual interaction, such that doctors rely on nurses to perform health check-ups, and everyone relies on the receptionists to make the process of patient appointments manageable (Unsworth & West, 2000; West & Slater, 1996). In fact, this type of team is sometimes known as patient care or production and service teams, such as ward and primary healthcare teams (Bosch, Faber, Cruijsberg, Voerman, Leatherman, Grol, Hulscher & Wensing, 2009; Borrill, Firth-Cozens & West, unpublished). Surgical teams, however, have also been categorized as action teams as they may only be together for a few hours (Borrill et al. unpublished).

## 2.4 Benefits of Teams

Having defined teams and the type of team with which this research will be conducted, the key advantages of working in a team which were outlined in Chapter One must be elaborated upon to focus on the benefits of teamwork. In Chapter One it as established that teams have been increasingly used in recent years due to globalization and the changing international environment. Also apparent have been the pressing needs to meet international competition and deliver new, innovative quality products and services more efficiently and

flexibly (Delarue, De Prins, 2004). However, insufficient research evidence has been presented in this regard; also absent is serious analysis of the inherent benefits of teams.

Scholars have identified many reasons as to why teams are beneficial to any type of organization. In general, implementing team-based working in organizations improves organizations' flexibility and productivity as it allows them to speedily develop and deliver cost effective, good quality services and products and organizations have reported improvements in safety, absenteeism, and employee attitudes after effective teams were implemented (Cohen & Ledford, 1994; Manz & Sims, 1993; Mohrman, Cohen & Mohrman, 1995; Ray & Bronstein, 1995; Beyerlein & Harris, 1998). In addition, teams often make better quality and more innovative decisions because of the knowledge sharing environment which allows cross-fertilization of ideas, skills and experiences and better information flow as teams can integrate and link information in ways that an individual cannot (Ray & Bronstein, 1995; Manz & Sims, 1993; Mennecke & Bradley, 1998; Cohen & Ledford, 1994; Mohrman, Cohen & Mohrman, 1995).

Furthermore, a team often possesses increased efficiency when it is responsible for solving a problem and for making decisions itself because team work increases the employee's sense of commitment to finding a common solution and they are more likely to adhere to the implementations which they have themselves created than to those that are forced upon them. Therefore their job satisfaction, morale and productivity increases with the level of responsibility they are given (West et al., 1998; Cohen & Ledford, 1994; Hoevemeyer, 1993).

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Much research has been conducted which shows the validity of the above claims: The value of teams in terms of production was assessed by Macy and Izumi (1993) who conducted a meta-analysis of 131 field studies of organizational change over a 30 year period and found that financial performance improves with the creation of autonomous teams and team development interventions. These were also found to improve behavioral measures of performance such as turnover and absenteeism. Flattening of structures and increased employee involvement has also had positive effects for financial and behavioural performance. Several organizational benefits have been proposed in the literature on teams: Glassop's (2002) research into Australian work organizations used the Australian Workplaces Industrial Relations Survey (1995) on data collected from 2001 firms across the private and public sectors. The main survey included four questionnaires: workplace characteristics; general management; employee relations; and union delegates. The questionnaires were conducted using face-to-face interviews with the senior manager in each workplace. Through a literature review six organizational benefits of teams were identified: workplace productivity; improvements to product/service quality; a reduced management structure; lower levels of absenteeism; reduced employee turnover and increased industrial harmony. To test these benefits the AWIRS95 data set was utilized. It was found that the primary benefits of firms with team structures were increased productivity, a flatter management structure, a low level of employee turnover and absenteeism and increased job satisfaction.

Cohen and Ledford (1994) assessed the effectiveness of 1337 people and 163 self-managing and traditionally managed teams in a telecommunications company. Data sources included employee questionnaires, supervisor questionnaires, manager questionnaires, questionnaires from union local presidents, performance data from small business sales offices, and accident and absenteeism records. In addition, case studies of self-managing teams were completed using interview and observational data. Through these questionnaires team member satisfaction, group performance and group member behaviour were assessed. It was found that self-managed teams were more effective than traditionally managed teams, especially in terms of quality of work life, increasing productivity, commitment and job satisfaction.

From reviewing evidence regarding the actual effectiveness of teams, Allen and Hecht (2004) focused on the psychological benefits for team members, rather than the actual practical benefits and argued that teamwork is particularly beneficial as it provides individuals with socio-emotional and competence-related benefits as they find that faith in the effectiveness of teams among managers is greater than research evidence suggests it should be. The socio-emotional benefits include satisfying the social needs of belonging, positive attitudes as working in groups is perceived as fun and reduction of uncertainty. Competence related benefits include increased attribution opportunities (as team members can attribute failure to other team members but can attribute success to the characteristics of a team); high performance aspirations as working in teams reduces disillusionment found in individual work; and feelings of individual superior performance can be gained.

As well as the above mentioned benefits, there are several ways that teams have improved healthcare services: teams have been found to reduce hospitalization costs as Sommers et al. (2000) found in their study of primary healthcare teams compared to individual physician care across 18 private practices. The reasons were that healthcare teams reduced hospitalization which is a more expensive option than setting up a team and conducting regular home visits. In fact Eggert et al. (1991) found that team-focused case management reduced total healthcare expenditures by 13.6% in the USA when compared to individualized case management due to earlier discharge, organized home support and reduced hospitalization.

Team working has also been shown to improve healthcare service provision: nurses in England found that working in teams reduced duplication and allowed specialist skills to be used more effectively, thus streamlining patient care (Ross, Rink & Furne, 2000). This was also shown in a community mental health team in England in which a threefold increase in the rate of commencing care, a doubling in the prevelance of treated psychiatric disorder and a reduction in demand on the hospital's outpatient services and care was provided more quickly and accessibly (Jackson et al., 1993).

Patient mortality has also been shown to decrease as a result of team work: West et al. (2002) found that the higher the percentage of staff working in teams in hospitals, the lower the patient mortality. Of the hospitals studied, where over 60% staff worked in teams, mortality was around 5% lower than expected.  In addition, patient satisfaction has been found to increase: Sommers et al. (2000) found that satisfaction increased if patients had access to

primary healthcare teams rather than doctors alone and reported fewer symptoms and improved health overall.

Staff motivation, satisfaction and reduced stress levels also improve with team working and teams work more innovatively (West & Anderson, 1996). Carter & West (1999) found that working in teams with clearly defined roles, working together for a particular goal, each with an individual role and recognized internally and externally as a team, had lower stress levels than teams that did not fit these criteria.

The above paragraphs highlight the benefits of introducing teams to an organization. However, some scholars highlight important challenges and difficulties faced by introducing teams to organizations. Teamwork is not an automatic consequence of co-locating people together, instead it depends on a willingness to cooperate for a shared goal and for the correct organizational structure: if a group of workers does not rely upon each other in order to accomplish common tasks or goals, it may be difficult to foster the collaborative spirit that teams need to work effectively (Baker et al 2006; Guzzo 1986).

Steiner (1972) argued that actual team productivity is less than it could be because of process losses including coordination problems and motivation problems. Coordination problems are those encountered due to the difficulties with arranging and integrating other people. Obviously, the larger the team, the more problems co-ordination will present: arranging times for meetings, coordinating tasks, integrating and passing on information are activities which all have the potential to limit the effectiveness of the team. Meanwhile motivational process losses occur when individuals use less effort in performing a task in a

group than when performing the same task by themselves (Unsworth & West, 2000). Therefore, scholars must bear these difficulties in mind when studying the benefit, and effectiveness, of teams.

## 2.5 What is Team Effectiveness and How is it Conceived in the Literature?

The definition and the benefits of teams themselves have been discussed. However, the research question focuses on predictors of team effectiveness. Therefore, what team effectiveness is and how different researchers view it must be considered. Research on team effectiveness can be traced back to the seminal Hawthorne studies in 1939 in which the importance of inter-team relations in organizations, the influences of teams on their members, and the significance of informal groups in influencing work-related behavior was established (Roethlisberger & Dickson, 1939). Since then the long history of research into team effectiveness has focused on different elements of teamwork and what constitutes team effectiveness has become far more complex (Hogg & Abrams, 1988; Mathieu, 2008).

Originally, team effectiveness was considered to be the direct outcome of team performance, an element whose definition has also been highly debated: its definition was simply classified as the completion of a task (Senior & Swailes (2004). However, its meaning has been expanded to incorporate not only the result of action, but the action itself (Campbell, 1990 in Landy & Conte, 2007) and within this broad definition, it also must be seen as a multi-level phenomenon that occurs from individual team members to team-level action (Salas et al., 2007). However, when reading the definition of effectiveness as

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"producing a decided, decisive, or desired effect" (Merriam-Webster's Dictionary of Law, 1996), it is apparent that effectiveness can not take this definition, but that it is the result of a decisive process in which the output must be compared to a subjective and objective standard (Salas et al., 2007).

Scholars' definitions of team effectiveness are extensive and broad. As Salas et al. (2007) point out; team effectiveness has been 'operationalized' in terms of records of productivity, employee satisfaction, manager judgments, and records of performance appraisals. The next paragraphs will consider some researchers definitions of team effectiveness in order to find one suitable for this research. Campbell (1990) simply defines team effectiveness as the evaluation of the results of performance. Tannenbaum, Salas and Cannon-Bowers (1996) offer a more extensive definition of team effectiveness as a combination of team performance in terms of outputs and the team's ability to grow and regenerate itself. Many definitions, however, tend to be divided into three categories loosely based around team performance, team satisfaction and team functioning (Hackman, 1987 & 2008; Mohrman, Cohen & Mohrman 1995; Cohen, 1994) Hackman (1987 & 2008) divides team effectiveness as follows:

- The team's product meets or exceeds the standards of quantity, quality, and timeliness of the people who receive, review, and/or use it, since it is clients' standards and assessments that count in assessing team products.

- The team contributes positively to the learning and personal well-being of individual members in terms of positively satisfying interpersonal relationships and personal learning.

- The team's work processes – in particular interaction – enhance members' capabilities to work together well in the future and the team becomes adept at detecting errors and opportunities (Hackman, 2008, pp. 4-5).

Mohrman, Cohen & Mohrman (1995) offer an almost identical definition stating that team effectiveness is centered on: team performance, which leads to the customers' approval of the groups' productive outputs; interdependent functioning where the team members rely on each other; and finally team satisfaction where each team member is happy to be part of the team.

Cohen (1994) also divided team effectiveness into three overall categories, the first two being very similar to those of Hackman (1987 & 2008) and Mohrman et al.(1995) while the last category, although focusing on team functioning, looks at negative behavior in particular. The categories are as follows: team performance, including controlling costs, increasing productivity and increasing quality; team members' attitudes about quality of work life including job satisfaction, team satisfaction, satisfaction with social relationships, satisfaction with growth opportunities and organizational commitments; and finally withdrawal behavior, including absenteeism and turnover levels (Salas et al. 2007).

Sundstrom, Demeuse and Futrell (1990) however, only consider team effectiveness as being divided into two categories: managers' and customers' judgments about acceptability of performance and team viability, where team viability is defined as commitment on the part of team members to continue working together. However, this view fails to consider both the satisfaction of

team members and their ability to work together in the future. Therefore, this research will adopt Hackman's (1987 & 2008) definition of team effectiveness as the most comprehensive and as most suitable for use with the ATPI measure as it includes team member satisfaction and attachment, team effectiveness and team innovation in terms of performance, and inter-team relationship.

## 2.6 Models and Predictors of Team Effectiveness

In the previous section, the broader view of what team effectiveness is was defined. Therefore, this following section will focus on the results of reviewing several models and frameworks for measuring team effectiveness. There are over 130 models for measuring team effectiveness (Salas et al. 2007) and as yet no attempt has been made to create a universal model of team effectiveness (Essens, P., Vogelaar, A., Mylle, J., Blendell, C., Paris, C., Halpin, S., Baranski, J., 2005). Probably the most common theme in team effectiveness models is the use of the IPO (input-processes-outputs) framework, whose origin sits within general systems theory, as a guiding framework (McGrath 1964). IPO models are useful as they highlight the importance of processes as mediators or moderators of the relations between input and output factors. Therefore these models capture the dynamic interactions and emergent states that constitute team work, especially as they emphasize the importance of outputs beings able to feed back into inputs, as well as the linear interactions between inputs, processes and outputs (Tannenbaum 1992; Kozolwski & Ilgen 2007). However, they are not the only type of model: Salas, Stagl and Burke (2004) identify a second model type as the Meta framework which sees the

relationship between inputs and outputs more directly and does not consider processes to be mediators between them.

In addition to these two model types, scholars tend to adopt different theoretical approaches when developing their models. Paris et al. (2000) have identified eight of these theories: the first is the *social psychological* approach which relates to the social and psychological implications of team members' relationships and interactions with one another; secondly there is the *sociotechnical* approach which concerns the technical and work-related implications of team members' relationships and interactions with one another; third comes the *ecological* approach which relates to the spacial relationships of team members with their organizational or working environment; the fourth, is the human resource approach, focusing on the utilization of human capabilities and talents; the *technological* approach is fifth, relating to industry or applied science, or to technological progress; sixth, is the *lifecycle* approach which pertains to changes within a team as a result of its maturation or evolution over a lifecycle; then there is the seventh, which can be classified as the *functional* or task-oriented approach, concerning team roles or functions and tasking; finally comes the *integrative* approach which is inclusive of multiple approaches or models (Paris et al., 2000). The uses of these different theoretical approaches will be highlighted as the different models are reviewed.

Since the focus of many later models has been around McGrath's (1964) IPO model, it is necessary to elucidate this in greater detail. McGrath's model is also known as the functional or task-oriented approach (Paris et al., 2000; Wittenbaum et al, 2004). It classified both input and output variables into three

sets: those that describe individual group members; those that describe the group as a whole; and those that describe the environment in which the group operates. More specifically, inputs refer to the pattern of member skills, attitudes, personality characteristics, structure, level of "cohesiveness", group size, group task characteristics, reward structure and level of environmental stress. Meanwhile outputs are characterized as performance judged by relevant others external to the team; meeting of team member needs, and; viability or the willingness of members to remain in the team (McGrath 1964 in Hackman, 1987). In principle, all relevant variables can be assessed at any two points in time, making it possible to trace changes in the state of the system over a specified time period.

A key assumption of McGrath's IPO model is that input states affect group outputs via the dynamic interaction and activities that takes place among members in order to resolve their task demands; this group interaction is the process element in the model (Hackman, 1987). In other words, this model works by allowing the researcher to test whether inputs predict outputs and which factors predict which; whether processes predict outputs and which factors predict which; and finally whether processes moderate the relationships between inputs and outputs. Hackman (1987) offers an example of how this model should work: If a highly cohesive group were to perform better on some task than a group low in cohesiveness, it should be possible to explain the performance difference by comparing the interaction processes of the two groups. Maybe the cohesive group encouraged each other and talked a lot

about their work or they simply spent more time together working on the task. Whatever the reason, it is made evident through group interaction.

Gladstein (1984) offers a more integrative approach by adding another element to McGrath's (1964) IPO model; organization-level input factors such as resources, and organizational-structure variables, such as rewards. The relationships between these organizational-level inputs and individual-level inputs, such as group composition and structure, are mediating by group process, much like in McGrath's original model (Salas et al. 2007). Hackman (1987) develops the IPO model further with a more social psychological approach to show how a broad range of variables can influence team work and that input factors are related to team processes which in turn are related to team outputs. His model also highlights the importance of creating an organizational context that reinforces teamwork via rewards and education, as does Gladstein's (1984). In addition, Hackman includes process criteria that helps identify team weaknesses including, level of effort and knowledge and skills and two moderating variables including the ability of the group to minimize process losses and the material resources available to the team (Salas et al. 2007). From this model we can see the development of the process elements of the IPO model.

Tannenbaum, Beard and Salas (1992) developed an integrative framework based on prior IPO models in which the significance of considering all variables in context is highlighted and in which variable types are distinguished. In this model, there are four high-level input variable types: nature of the task (organization, type and complexity), members' attributes (knowledge

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and skills, motivation, attitudes, mental models and so forth), team characteristics (distribution of power, similarity of members, team resources, climate and cohesion) and work structure (task assignment, team rules and communication structure). Although other models had previously considered these, it is the first time they were grouped in this way. This model suggested that these types affect each other, team members and team processes (coordination, communication, conflict resolution, decision-making, problem solving, and boundary spanning) over time, which in turn affects team performance. It also recognizes the use of team building interventions as a moderator between inputs, processes and outputs (Salas et al. 2007).

Cohen and Bailey (1997) developed the IPO framework to focus more on contextual issues by depicting environmental factors as the force behind team and compositional inputs, thus this is a more ecological approach. This approach places teams into their wider context of existing inside organizations, which in turn exist in environments, thus offering a multi-level model. This approach suggests that environmental and organizational contextual factors affect the nature of leadership practices, task design, and other features that teams will likely enact. Burke, Stagl, Salas, Pierce, and Kendall (2006) went on to propose a model of team adaptation within an IPO framework. Team adaptation is defined as an emergent phenomenon that occurs over time when one or more team members utilize their resources to change current behaviors or attitudes to meet different demands. This is the only model that has radically departed from the traditional focus on task and team performance as it focuses

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on the team resources more than anything else (Salas et al. 2007) and due to its focus on changes, this can relate to a lifecycle approach (Paris et al., 2000).

Campion et al. (1993) synthesized all previous models to create an integrative Meta framework of team effectiveness, thus this model falls into the second category of team effectiveness models (Salas et al., 2004). This model is different to IPO models as it only focuses on factors that directly affect team outputs, not mediators and moderators of relationships between inputs and outputs. The model highlights five major categories of team effectiveness variables: job design (self-management, participation and the variety, significance and identity of tasks), interdependence (in terms of goal, task, feedback and rewards), composition (including heterogeneity, flexibility, relative size and preference for group work), context (training, managerial support, communication and cooperation between groups) and process (potency, social support, workload sharing, communication and cooperation within groups) (Salas et al. 2007). Again, the variables are being developed in a more structured way than previously used, however, excluding mediators and moderators makes this model somewhat simplistic.

In 2005 Salas et al. developed the "Big Five" model which also fits into the Meta framework and adopts the socio psychological approach as it tried to highlight the essence of teamwork by illustrating the relationships between five core processes: team leadership, team orientation, mutual performance monitoring, backup behaviour and adaptability. In addition, shared mental moods, closed-loop communication and mutual trust can be considered. Their model states that these eight constructs are dynamically related to form

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teamwork. The most recent model is offered by Baninajarian and Bin Abdullah (2009) also falls into this category (although it adopts both the sociotechnical and socio psychological approach), as it only considers two sets of factors that influence team effectiveness, and does not consider processes as mediators. The first category is group structure (team-work context, group design and group synergy) and the second is the role of the facilitator in group process, suggesting that the effectiveness of a team is determined by the ability, knowledge, experience, skills and personal characteristics of the facilitator and by the level of team interdependence and group composition.

All of the above mentioned models have contributed to measuring team effectiveness and although each model is different and adopts a different approach to measuring team effectiveness, there are also several commonalities. Of the nine team effectiveness models reviewed, all but three are based on the IPO model. Therefore, these six models have commonalities as they are based on the same structure and tend to build on previous IPO based models. However, for those that do not adopt this model, commonalities can be found in the specific variables which are highlighted as being significant. The main differences between all of the models, regardless of what type, were which specific variables, constructs, mediators and moderators were highlighted (Salas et al. 2007) and which theoretical approach was adopted (Paris et al, 2000). In addition, the degree to which models consider team effectiveness as a dynamic process differed with Salas et al. (2005) and Burke et al.'s (2006) models being the most dynamic and those of Hackman (1987), Gladstein (1984) and Campion et al. (1993) being the least dynamic (Salas et al., 2007).

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Meanwhile, the main difference between the IPO and Meta Framework models is the significance assigned to each of the relationships established: Input-process-output models not only see direct relationships between the variables, but they also see the mediatory role of process variables. Meanwhile, the Meta Framework models treat the links between variables and effectiveness much more directly by studying the impact of one or more independent variable on the team effectiveness.

In regarding these different models and means of measuring effectiveness, the difficulty in accurately determining team effectiveness is made apparent: there is no standard measure and researchers often adopt their own approaches. It is, however, clear that the IPO model is most favoured, suggesting that inputs, processes and outputs need to be examined to gain a full understanding of team effectiveness. However, since researchers adopt so many different approaches it is very hard for studies to be combined and compared and there are still many deficiencies in the models used. The fact that different researchers focus on different variables and predictors is one problem, as some choose to focus on processes in particular (Salas et al., 2005) or on organizational context (Cohen & Bailey, 1997). Also problematic is the fact that all models adopt different approaches, for example, Hackman's (1987) model adopts the psycho-social approach focusing on the social and psychological implications of team members' relationships/interactions with one another, while Campion (1993) and Tannenbaum et al (1992) adopt integrative approaches, in an attempt to include multiple models in their own.    As a result of these deficiencies in the models, they cannot be fully comprehensive measures of

team effectiveness. That is why this research will adopt the ATPI measure, developed by West, Markiewicz and Dawson (2005), including five team effectiveness measures, a comprehensive range of predictors and elements of all theoretical approaches; it will be tested in another context to determine whether or not it can be developed into a more universal measure.

## 2.7 Conclusion

In this chapter a team has been defined as 'two or more individuals working together with different roles and responsibilities to achieve a relevant common goal for a wider organization' (Kozolwski & Ilgen, 2006). Team effectiveness has been defined through its collective 'product' meeting or exceeding set standards; , the team contributes positively to the learning and personal well-being of individual members  and the  team's work processes enhance members' capability to work together well in the future (Hackman, 1987, 2008).

In relation to healthcare, it was concluded that the most common type of team is the work team and that teams are beneficial because they reduce hospitalization costs, improve service provision, lower patient mortality, enhance patient satisfaction, and improve staff motivation, well-being and innovation (Cohen & Bailey, 1997; Sommers et al., 2000; Eggert et al., 1991; Ross et al., 2000; Jackson et al., 1993; West et al, 2002; West, 1999; West et al, 1996).

From the review of the different IPO and meta-framework models for measuring team functioning and effectiveness, it was concluded that there is little agreement on an overall view of team effectiveness as so many models

focus on different elements of team effectiveness using different variables. However, it was found that IPO models are more effective as they measure the mediated impact of processes on outputs, not only the direct impact of inputs on outputs. Further analysis of how exactly the measurement is conducted and which variables are viewed as significant needs to be done before deciding which exact measure to adopt.

# CHAPTER 3

## DETERMINANTS OF TEAM EFFECTIVENESS

### 3.1 Chapter Overview

The research so far has considered that there are many different models for measuring team effectiveness which fall into the IPO or Meta Framework categories, and which highlight different factors as being significant for measuring team effectiveness (Salas et al., 2004). Different measures for assessing team functioning also consider different factors as significant. It is therefore important to review all the significant input and process factors mentioned in the models in order to determine which factors predict the effectiveness of healthcare teams. It is also necessary to ascertain which factors are most significant and must be included to ensure that the measure chosen for this research is comprehensive. The remainder of this chapter seeks to review the measures of team effectiveness and team functioning to assess which method and measure should be adopted.

### 3.2 Key Input and Process Dimensions and Components

The factors that will be reviewed are those that have been highlighted as significant in the models reviewed in Chapter Two. Throughout the review of these inputs and processes, it will be questioned whether or not inputs influence team outputs -, such as team member satisfaction and innovation – directly. In addition, the review will ask whether or not processes influence outputs as mediators, in order to help evaluate if these variables are necessary for measuring team effectiveness and if the use of IPO models is valid.

### 3.2.1 Key Input Dimensions and Components

### 1. Task Design

The team's task is central to the team as they are chosen in relation to the task and the entire purpose of the team is to complete this task (Borrill et al., unpublished). Campion, Medsker and Higgs (1993) argue that one of the advantages of groupwork is that groups can increase productivity and employee satisfaction simultaneously and therefore they could be crucial to avoiding the production-satisfaction trade-off which was previously accepted as an intrinsic part of work design. However, as a result, the approach to task design needs to be adapted. Recently, scholars have been considering this as the importance of task design in relation to team performance has been realised. The task of the team is central to its work as it influences what the objectives are and how it will function, for example in healthcare teams; the task is an action, a decision or the provision of a health service. Therefore, it is the responsibility of the team leader to design a clear task to ensure effective work (Oandasan, Baker, Barker, Bosco, D'Amour, Jones, Kimpton, Lemieux-Charles, Nasmith, Rodriguez, Tepper & Way, 2006)

Stewart and Barrick (2000) describe team task design as a series of structures and roles within a team context that determine the allocation of tasks, responsibilities, and authority. In 1976 Hackman and Oldham published their job characteristics theory in which the following were seen as significant to producing motivating task design. They have since been used by scholars to predict factors such as organizational commitment. They are as follows:

1. The degree to which a task requires a group to use their different skills and talents.

2. Group members are involved in the task from beginning to end, and can see it as a whole.

3. The task has a significant impact on the lives or work of others, either inside or outside the organization.

4. The group has substantial freedom, independence and autonomy in how the task will be performed.

5. The group receives regular, clear and direct information on the effectiveness of their performance (Hackman & Oldham, 1976, pp. 257-258).

In their study of workers in 3 occupational groups, Batt and Applebaum (1995) found that the task design characteristics of identity and significance had a strong positive effect on job satisfaction and organizational commitment.

## 2. Autonomy

Problems can occur within teamwork if authority between the team and the manager is not balanced effectively: if the manager is too controlling of the team, anxieties will develop within it; however, if the manager allows too much autonomy, the team may head off in an inappropriate direction or reach a state of anarchy (Hackman, 1998). Nevertheless, if teams can self-manage and make their own decisions about assignments, procedures and schedules, evidence suggests that they are likely to be more effective. As Cohen and Bailey state, employee autonomy amplifies employee attitudes, behaviour and performance

(Cohen & Bailey, 1997). Therefore, a degree of team autonomy is essential, a fact which firms and organizations have come to recognize in the last decade. In fact, this is to the degree that autonomous work teams are now inherent in many recent attempts to transform organizational work systems (Guzzo & Dickson, 1996).

Many scholars have studied this topic, most of them concluding that a degree of autonomy had a positive effect on team effectiveness. In a literature review of over 54 studies, Cohen and Bailey found that "substantive participation generally appears to have positive performance impacts" (Cohen & Bailey 1997, pp. 249). Throughout their review, Cohen and Bailey highlight research projects which indicate this fact and which show that teams that are not autonomous or semiautonomous do not have such a strong effect on team performance (Cohen & Bailey, 1997). Similarly, in a review of healthcare team effectiveness literature from 1985 – 2004, Lemieux – Charles and McGuire (2006) found that increasing team autonomy was associated with higher levels of staff satisfaction and retention of unidisciplinary inpatient nursing units and it led to a decline in hospital readmissions on home care teams.

In Cohen, Ledford and Spreitzer's (1996) study on team effectiveness in telephone companies, autonomous teams were more effective than other teams and experienced greater job satisfaction. It was further noted that if autonomy is not given team members often lose faith in the value of teamwork. The criteria for measuring team effectiveness in this study included quality, productivity and safety of team performance. Data was obtained from different sources such as team members and higher levels of management, as well as indicators of

effectiveness from company records, e.g., as customer complaints and monetary losses due to absenteeism (Cohen, Ledford & Spreitzer, 1996). Leach, Wall, Rogelberg and Jackson (2005) also found that autonomy had a positive impact on team performance; however the autonomy should be built through knowledge, skills and potential to succeed.

Cohen (1993) found that not all autonomous work teams increase team effectiveness in all areas. Sprigg, Jackson and Parker (2000) agree with this view. They conducted research among 5 UK-based wire rope manufacturing teams and found that in teams where task interdependence is low, autonomy often resides within individuals, There is therefore little group cohesion and as a result, little job satisfaction. This view is also reflected in the research of Cordery, Mueller and Smith (1991) where autonomous work teams were compared at mineral processing plants in Greenfield, Australia. A key distinguishing feature of the Greenfield teams was in the organizational structure that centered on the operation of autonomous work in the processing area. These teams had decision-making responsibility for such things as allocating work, attending to administrative matters, and setting priorities, as well as having influence on hiring decisions. Results indicated that autonomous work teams were associated with more favorable employee attitudes than were non-autonomous work teams. However, both turnover and absenteeism were higher among members of autonomous work teams in comparison with non-autonomous teams. Conversely, Beekun's (1989) research indicated that the use of autonomous work teams is associated with decreases in escape behaviour including absenteeism and turnover.

Meanwhile Langfred (2004) urges that team trust is essential for team autonomy to be a success since such teams are self-monitoring. In addition, Tata and Prasad (2004) identified the significance of organizational structure for determining the success of team autonomy: it is likely to be more successful in organizations where decision making authority is distributed and there are fewer explicit rules, policies and procedures. Despite this mixed review, overall, the view of team autonomy as an important variable is positive, in particular as having a direct impact on job satisfaction and attachment due to reduced absenteeism and turnover.

## 3. Feedback

Another important variable is establishing a feedback system within the team. For a long time scholars have been exploring the link between feedback and team effectiveness. The interest in this is rooted in Baker and Salas' (1992) seven teamwork skill dimensions, two of which were providing and receiving feedback. Pearson (1991) studied the performance effects of feedback and found statistically significant increases in productivity over time as a consequence of receiving performance feedback. In a study on team building Goldsmith and Morgan (2000) highlight the significance of, and developed a system for, using focused feedback to build teams effectively without wasting time. Their method permits team members to express their views, and thus it allows them to develop their own behavioural change strategy, rather than be told how to change. This consequently increases their cohesion.

Jabri (2004) also considered the significance of team feedback. However, in his research, he looked at the use of dialogue in feedback and found that teams which were willing to discuss their differences were able to create a 'shared meaning' by learning from each other's viewpoints and discussing issues that may be impeding their performance. Thus, feedback is a valuable variable for improving productivity and team learning. In a review of multidisciplinary healthcare teams, Xyrichis and Lowton found that audit was a valuable feedback tool to help sustain and improve performance through the use of appraisals and rewards to the extent that it can lower levels of patient mortality (Xyrichis & Lowton, 2008).

## 4. Task Relevance

Task relevance or significance is also a factor that influences team effectiveness. As Hackman and Oldham (1976) stated, if the task has a significant impact on the lives or work of others, either inside the organization or for the world at large, the team members' motivation, innovation and effectiveness, will increase. For example, as West et al. (2004) highlight, monitoring the effectiveness of debt collection in an organization is not as noteworthy as focusing on the well-being of elderly people and therefore less innovation may result. However, in Stewart's 2006 study, it was found that although in some cases there was a positive relationship between team task relevance and performance, it was not universal (Stewart 2006).

## 5. Interdependence

According to Kozlowski and Bell (2003), if a team does not have task interdependence between members, it serves more as a group of individuals

than as a team. Baker et al. (2006) concur, describing task interdependence as the defining characteristic of teams and present the example of an emergency Caesarian-section to highlight this fact:

> The nurse handling the case is typically the first to observe fetal distress and must communicate this information to the attending physician. The doctor must decide if a C-section is necessary based upon the information the nurse provides and review of information collected from the fetal heart rate monitor. If the attending decides to operate, appropriate staff must be notified (anesthesiologist, neonatologist, or pediatrician), and the patient must be moved to surgery. Before making the initial incision, the patient must be properly anesthetized and the staff should be briefed as to the status of the patient and the baby. This process, which involves a series of interdependent steps, can take place in a matter of minutes depending on the history of the case and the level of fetal distress observed (Baker et al, 2006, pp.1587).

Shea and Guzzo (1987) divide interdependence into two categories: task interdependence, the degree of task-driven interaction among group members, and outcome interdependence, when the task accomplishment has significant consequences for some or all members of the group. They believe that the levels of both forms of interdependence vary depending on the task or the organization and that they should be balanced in order to increase effectiveness: if a team has considerable task interdependence but little outcome interdependence it will not be so effective. In addition, patterns of interaction can affect the potency of a team.

Shea and Guzzo (1987) tested this theory on a national retailer who was introducing a group-based bonus scheme based on the rate of sales within the team. The results demonstrated the significance of outcome interdependence within teams: Sales increased by 28%, the level of customer service was higher, as was the team members' level of interaction, and - as a result - their potency. Shea and Guzzo (1987) also feel that these levels would not have increased as

much had there not been such a high level of task interdependence among the teams.

Hollenbeck insists that interdependence must be balanced further by arguing that high team interdependence does not always improve team performance (Hollenbeck 2004). Instead he believes that the task type influences the level of interdependence needed. For example, if teams are engaged in mostly behavioural tasks, only moderate levels of task interdependence are needed. Rather it is high levels of external team leadership that improve team performance (Hollenbeck 2004). Hollenbeck built this view on the research of Stewart and Barrick (2000) who observed that different teams, with similar technologies, displayed different levels of interdependence thus indicating that interdependence is an aspect of teamwork that can be controlled and adapted to create optimum team effectiveness.

Analyzing team interdependence in relation to team-efficacy and performance Gulley, Incalcaterra, Joshi, and Beaubien (2002) found that interdependence moderated the relationship between team-efficacy and performance: when interdependence was high so was team efficacy and performance. In addition, Somech, Desivilya and Lidogoster (2009) found that high levels of team interdependence in 77 work teams led to cooperative conflict management and thus improved team performance.

From this review, interdependence has been shown to be a highly significant variable for predicting team effectiveness, both as a moderator for other inputs and processes, such as potency, and directly, by improving inter-team relationships and productivity.

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## 6. Team motivation

Cohen believes that higher motivation and satisfaction can lead to the improvement of certain aspects of performance and the decrease of absenteeism and other withdrawal behavior. (Cohen 1993). Motivation is a factor in and of itself but which can be influenced by many input and process elements; it can be instilled in teams in numerous ways. It can emerge from within the team: if teams find the task significant, if it requires them to adopt a variety of skills, and if there are potential team rewards, a team's motivation will be increased (Hackman & Oldham, 1976). For example, in a report on teamworking in primary healthcare, an example of a multidisciplinary team established between GPs and community pharmacists found that pharmacists and GPs embraced the cooperation and the pharmacists in particular were motivated to extend their professional role, indicating the significance of task in motivating team members (Royal Pharmaceutical Society, 2000).

Having clear objectives is also significant in increasing motivation: In a Clinical Teams Programme, team leaders of NHS Direct teams met to set objectives for the service. In so doing, they became more aware of the priorities and the team's motivation and enthusiasm for achieving these priorities increased (Benson & Rice 2009). In addition, Guzzo and Dickson (1996) feel that team potency is a highly motivational factor: if a team believes it *can* achieve something, it will be motivated to succeed. Team optimism and potency are especially significant for increasing team effectiveness when teams are newly formed (West, Patera & Carsten, 2009). Shamir (1990) considers 3 different forms of group motivation:

- Calculation – where team performance is expected to be rewarded or sanctioned.

- Identification – where being a team member influences one's self-concept

- Internalization – where accepting team beliefs and norms works as the basis for motivated behaviour (Shamir, 1990, pp. 313).

Although calculation is an important factor in motivating teams, West et al. (2004) suggest it should be undertaken with care, since some research suggests that allocating rewards and sanctions may have a negative impact upon intrinsic motivation.

Both West et al. (2004) and Earley (1994) see induction and training activities as important aspects of motivation. West et al. feel these activities "shape the psychological contract, potentially enhancing motivation and developing skills as well as the required questioning, sharing, and challenging behaviours" of a team (West et al, 2004, p. 282). Earley (1994), on the other hand, highlights the fact that motivation gained from training depends on the individual team members' personality types: depending on whether a team member is individualist or collectivist, s/he may gain different levels of motivation from either group-focused or self-focused training. From this discussion, it can be seen that many input and process factors influence the level of a team's motivation, therefore, this term will be referred to throughout the chapter.

## 7. Knowledge, Skills and Ability

When looking at team skills, one must consider two factors: first, does the team have the skills required of them? Second, do they have the social skills to gel and work successfully as a team? (Hollenbeck 2004) Baker and Salas (1992) established the foundation for development of teamwork knowledge, skills, and abilities (KSAs). The authors identified seven teamwork skill dimensions:

- providing feedback

- cooperation

- communication

- team spirit and morale

- adaptability

- coordination

- accepting feedback

Stevens and Campion (1999) developed their model to include Interpersonal KSAs and self-management KSAs. They saw this as important because the nature of teamwork increases the interpersonal and social demands placed upon employees in comparison with traditional individual-based work strategies. As a result, if a team possesses poor interpersonal skills, the team's performance may be reduced. Work-teams, or patient care teams, must therefore display the following KSAs:

(1) Conflict Resolution – to possess the ability to recognize desirable and undesirable team conflict; to recognize the type and source of conflict; to implement a resolution strategy via integrative approaches to negotiation.

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(2) Collaborative Problem Solving – to pay the appropriate level of attention to the problem and to recognize obstacles to collaborative problem solving and implement appropriate corrective actions.

(3) Communication – to recognize and utilize decentralized networks to enhance communication; to communicate openly and supportively; to listen with active listening techniques; to use nonverbal and verbal messages and to recognize and interpret the nonverbal messages of others; and to engage in small talk.

In addition, if teams are given a degree of autonomy, and thus self-management, the team must possess the KSAs required to perform these basic managerial or supervisory duties. They can be split into two groups:

(4) Goal Setting and Performance Management – to help establish specific, challenging, and accepted team goals; to monitor, evaluate, and provide feedback on performance.

(5) Planning and Task Coordination – to coordinate and synchronize activities, information, and tasks between team members; to help establish task and role assignments for individual team members and ensure proper balancing of workloads (Stevens & Campion, 1999, pp.209-210).

If teams possess the social KSAs mentioned above, they are more likely to work in an integrated and effective manner. In addition to these skills, however, a team must possess the technical abilities to achieve the task at hand. In a review of KSAs for healthcare teams, Baker et al. (2006) identified that the following skills are most necessary when studying healthcare teams. As well as the above mentioned communication and adaptability, team leadership, back up

behaviour (similar to feedback and conflict resolution), mutual performance monitoring (in which all members regularly assess how they fit into the team and how effective the team is), shared mental models, mutual trust and team orientation are highlighted as being significant for establishing effective healthcare teams.

Yokl (2006) feels that teamwork has come to focus too much on soft skills and not on actual technical ability. He states that the key to establishing a good team is in fact finding the 'right people with the right incentives working on the right things'. Lemieux-Charles and McGuire (2006) emphasize the significance of both technical and soft skills as they found in their review of literature on healthcare teams that individual members and leaders seem to need a balance of technical and interpersonal skills, and a team as a whole must function well together both technically and interpersonally. In accord with this, when studying patient care teams, Wagner found that the most successful teams often include nurses and pharmacists with clinical and behavioural skills (Wagner, 2000).

Austin (2003) expresses a similar view by focusing on the significance of transactive memory consensus in which team members know who is knowledgeable in which field and where team members become specialists in certain areas for team performance. Austin's view is supported by the work of Zhang, Hempel, Han and Tjosvold (2007) who studied 104 work teams in China and examined the relationships between team characteristics, Transactive Memory Systems (TMS), and team performance. They found that while task interdependence, cooperative goal interdependence, and support for innovation positively relate to the work teams' TMS, TMS improves team performance.

Mohammed, Mathieu and Bartlett (2002) studied the impact of different kinds of skills on different performance outcomes, indicating the significance of considering team skills when selecting team members. They concluded that those with high academic ability had high levels of technical-administrative task performance while agreeableness and experience related to contextual performance.

To highlight the significance of team skills, in Bell's (2007) analysis of 89 different sources, the relationships between team composition variables, including personality and skills, indicated that factors such as team conscientiousness, agreeableness and collectivism influenced team performance (Bell, 2007).

## 8. Diversity

Another important factor impacting the effectiveness of team skills is diversity. It might be assumed that if a work team is diverse, it will possess many perspectives and skills and therefore will be more effective than like-minded work teams (Kravitz 2005). However, this is not always the case: when dealing with cross-cultural diversity specifically, a team's success can be improved by testing everything that is said and not making assumptions but asking questions to clarify cultural differences and to try and find a middle ground (Uday-Riley, 2006).

After reviewing research on team diversity, Mannix and Neale (2005) found support for both the positive and the negative effects of team diversity. They found that different types of diversity had different effects: factors such as

race, gender, and age were shown to have negative effects, whereas other types of diversity such as functional background and personality are more likely to have positive effects. This is exemplified in a case study of a healthcare team in which age, seniority, cultural diversity and experience caused cliques to form and harassment and bullying problems. With the help of an external facilitator, a space was created in which these diversities could be discussed and better understandings and a way forward was formed (Benson and Rice, 2009).

Jehn and Bezrukova (2004) established similar conclusions as they found that teams displaying diverse functional and educational backgrounds were paid higher bonuses, especially when working on people- , stability-, growth- and customer-oriented tasks. Wright and Bennett (2008) looked at race diversity in their study and found that teams built up of members from more collectivist societies, in particular Emirati women, were more likely to suppress differences in opinion or ideas for the benefit of overall harmony, while teams made up of more individualistic Anglo women, were willing to create conflicts in order to express their views. Matthew, Ellis and Evans (2008) support Mannix and Neale's (2005) view that gender can have negative effects on team performance if fault lines are activated along gender boundaries as this can lead to sub-group formation and reduce the level and creativity of idea generation. Leggat (2007) provides an example for how influential gender can be in shaping team effectiveness. She highlighted the difference in what male and female Australian healthcare team managers viewed as significant for team effectiveness: females saw negotiation and self-awareness of strengths and

weaknesses as significant while males viewed ability to influence as an important skill.

The different influences of diverse personalities on team effectiveness have also been studied widely. For example, if team members are emotionally stable, they are likely to deal with stress, maintain temperament and self-confidence across most situations. However, unstable individuals are less likely to be cooperative and will tend to have lower quality interactions thus displaying a negative affect on groups. As a result teams may develop negative work climates, which in turn will reduce team performance (LePine & Van Dyne, 2001). Team personality also influences performance: English et al. (2004) found that among aviation crews the team's level of conscientiousness affected the team's performance while individual conscientiousness did not so much. Neuman and Wright's (1999) research supports the view that personality traits such as conscientiousness and agreeableness are great predictors of team performance.

With regard to the divergence in the effect of different diversities, Mannix and Neale (2005) offer three suggestions:

- First, diverse teams are likely to be especially appropriate for tasks involving innovation whereas homogeneous teams are better for exploitation and implementation of what is already known.

- Second, diverse teams must be heavily assisted in developing their own identity and processes.

- Third, there should be space for minority opinions to be heard and a culture which encourages and rewards learning and change should be established. Team leaders play a key role in implementing these factors.

However, the third point seems difficult to instil in multidisciplinary healthcare teams as was noticed during a Clinical Teams Project. The researchers observed that diversity of hierarchy in this type of team had a great influence on participation: for example, a healthcare professional would not express their opinions in team meetings predominantly made up of professionals. The researchers also found that reflecting back the ways in which decisions are made to the team had significant impact with quieter members and night staff having their voices heard (Benson & Rice, 2009). These divergences in the benefits of diversity suggest that it is a highly important variable to study as its influence on team outputs can be both negative and positive.

## 9. Team Potency

Gibson, Randell and Earley (2000) feel that team potency is a great indicator of team performance. They believe that the best way of measuring team potency is through team discussion, an empowering activity in itself and thus a better indicator of the team's capability. Guzzo and Shea (1987) define potency as "the collective belief of group members that the group can be effective". A team's level of potency depends on the group's belief that they have what it takes to succeed; this could be skills, training, money and feedback. Feedback seems to have quite an influence on potency and performance: if a team receives positive feedback, the level of potency is likely

to increase and in turn, so will its performance. Interdependence also impacts on potency because the more a team works together, the more opportunity the team members have to evaluate their collective skill (Guzzo & Shea, 1987). In addition, higher levels of team potency and self-leadership are interlinked, and together they indicate higher team commitment (Bligh & Pearce, 2006). To increase team potency, team events which focus on joint achievable actions in a different environment have shown to be beneficial in healthcare teams as they allow perceptions about people at different hierarchical levels in the organization to shift (Benson & Rice, 2009).

## 10. Organizational Support

Managerial and organizational support is necessary if a team-based workforce is to succeed: team effectiveness in healthcare has been found to be higher when organizations value teams and provide them with resources and support as this can motivate health professionals to practice collaboratively (Fedor, Ghosh, Caldwell, Maurer & Singhal, 2003; Xyrichis & Lowton, 2008; Oandasan et al., 2006). Six areas of organizational support have been identified by scholars:

- Targets: teams need support to determine targets or objectives.
- Resources: organizations need to provide the necessary resources to the team to achieve its targets.
- Information: teams need information about what is happening in the organization, such as changes in strategy or policy.
- Education: organizations must provide appropriate education and training for teams to ensure team members can contribute most effectively.

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- Feedback: organizational feedback is required for teams to function effectively.

- Technical and process assistance: teams need to be provided with specialized knowledge and support to work effectively and need assistance when they encounter process problems such as interpersonal difficulties (West & Markiewicz, 2004; Borrill et al., unpublished). These will be discussed in greater detail throughout the chapter.

This view is reiterated by many researchers: Campion et al. (1993) found that since management controls the resources required to make group functioning possible, the culture of an organization and the top management must support the use of teams in order for them to be effective. Svyantek, Goodman, Benz, and Gard's (1999) research found that the impact of organizational support from immediate supervisors increased the impact of team building on productivity significantly as did support from higher levels of management. As Mathieu, Maynard, Taylor, Gilson and Ruddy (2007) conclude, the degree to which the wider organization supports a particular team design and orientation, the more motivated the members are to execute their work effectively through actions and interpersonal processes.

In Fort and Voltero's (2004) study of maternal nurses in Armenia, they found that organizational support factors were the most influential for team performance. The factors included having a job description, receiving non-monetary incentives from the employer and from the community; being satisfied with the organization of the work; having the necessary training, equipment, instruments and supplies; receiving performance reviews. This research

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concurs with Sundstrom, Meuse and Futrell's (1990) study in which it was concluded that team effectiveness depends on organizational support. West (1999) supported this view in a study of teamwork in healthcare, in terms of feedback and reward systems in particular, he noted that team members are likely to put more effort into producing quality work if quality is rewarded. He also noted that the most effective form of reward is when the whole team is rewarded. Support for educational development was also highlighted as significant in healthcare by Poulton and West (1993). However, while these factors have been identified as significant, many healthcare teams do not have good feedback or reward systems (e.g. General Practitioners in the UK are given bonuses whilst other team members are not) or receive clear targets from their organizations, indicating that organizational support needs to be improved in healthcare organizations (West, 1999; Borrill et al., unpublished).

## 11. Communication

Due to the simple fact that teamwork means working with more than one person, good communication is an essential aspect in creating an effective team. Anderson and West (1998) highlight five preconditions for effective team communication: 1. Teams must have a common social reality and language in which messages can be exchanged; 2. Team members must be able to consider the perspective of others within the team; 3. Team members must be motivated to communicate; 4. There must be a code of behavioral conduct among team members about how interactions take place; 5. Should communication difficulties arise, teams should be able to identify which precondition is not being met in order to develop an appropriate solution. In

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terms of healthcare, Ingram and Desombre (1999) identified communication as an important tool for team effectiveness as it can be used to resolve conflicts within teams and improve team visions. Outside teams it can be used between hospital departments to improve the necessary cooperation for the protection of both staff and patients, as regulation and public accountability become ever more unforgiving. Community relations might also be harmonized.

To improve communication within teams, several studies have identified effective, regular meetings as a useful tool (Xyrichis & Lowton, 2008): In an NHS guide to developing and sustaining effective teams, team meetings were identified as important not only for communication, but for team participation in decision making, reviewing progress towards objectives, recognizing achievements, reviewing how the team is working together and team innovation (Benson & Rice, 1999). Externally, to use communication as a tool for organizational support, Campion et al. (1993) believe that because teams must integrate with the rest of the organization, and the boundaries of responsibilities must be properly managed, it is necessary that teams communicate and cooperate with one another. They feel that it is the responsibility of the management to supervise these boundaries, and to externally integrate the group with the rest of the organization. In addition, managers must ensure smooth communications so that competition and conflict between teams does not result, thus indicating the importance of support from higher levels (Campion & Higgs, 1995). On the other hand, while Sutter (2005) believes that intra-team communication helps coordinate actions and makes employees work harder, he felt that communication with other teams in competitive team environments,

leads to collusion and significantly reduces team efforts, and therefore effectiveness.

West et al. (2005) highlighted the significance of communication from outside the team for team performance, especially for providing information about organizational changes that may affect the way the team works and thus its effectiveness. For example, if an organization makes changes to its policy which may affect how the team works, it is essential that this information is conveyed as soon as it comes into effect to prevent any confusion, and potential inefficiency: if the level of information available to the team members responsible for making a decision is maximized, the quality of decision making can be improved (Cohen & Bailey, 1997).

## 12. Team Training

Adequate training in elements such as team philosophy, group decision making, and interpersonal skills, as well as technical knowledge heavily impacts team effectiveness (Campion et al, 1993). In their study of 92 teams in the US Air force Hirschfeld, Jordan, Feild, Giles, and Armenakis (2006) found that that team members achieving greater individual mastery of designated teamwork knowledge facilitate better team task proficiency and greater teamwork effectiveness. It is important that the training given is appropriate for the team's needs and that it is carried out at a suitable time: if training occurs too early, people will forget what they have learnt and skills transfer will be reduced. In addition, it is imperative that courses are delivered which allow time for reflection and internalization, and those refresher courses are undertaken

throughout the team's work in order to maintain a competitive advantage (Hackman & Wageman, 2005).

The way in which teams receive training is also a key question among scholars. Hollenbeck (2004) challenges the traditional view that individuals should be trained on their individual tasks before being selected for teamwork. Reporting on several scientific studies, Hollenbeck views that "training recall, transfer, and post-training team performance actually improve when training occurs within a team context" (Hollenbeck 2004, pp. 358) and that this is due to team interactions and team leader support. Liang, Moreland, and Argote (1995) conducted a study to show the impact of team training in which two teams were trained on a specific task. One team was trained as individuals and the other one trained as a team. The team which trained as a team displayed greater team performance relative to those trained as individuals, thus supporting Hollenbeck's view. Healthcare teams can train together in simulated healthcare situations, such as creating an anesthesia environment with an operating room, standard equipment and situations requiring actual performance of clinical interventions. A life-like mannequin with appropriate breath and heart sounds permits team members to perform clinical procedures. Scenarios including overdose of inhalation anesthetic, cardiac arrest, and complete power failure are presented. The team skills trained in this simulated environment include making inquiries and assertions, communicating, giving and receiving feedback, exerting leadership, maintaining a positive group climate, and reevaluating actions (Baker et al., 2006).

In terms of what teams should be trained in, Ellis et al (2005) believe that task and team-generic teamwork skills training programs, which focus on developing skills that can be applied in a variety of contexts are best. Their research found that this kind of training can increase team members' teamwork skills and therefore, it works to improve overall team effectiveness. As well as highlighting the significance of team training, this also indicates the importance of cross training on the tasks, duties and responsibilities of other team members. Previously it was considered that team members should specialize on specific tasks, thus becoming experts in one area. However, recent scientific research suggests that cross-training actually enhances team functioning more than individual, task specific training (Hollenbeck et al., 2004). Earley (1994) however, looks at another influence on the effectiveness of training and suggests that the impact of training varies depending on team member personality. Focusing on the role of individualism-collectivism in shaping the impact of motivational training for individuals, Earley found that team-focused training had a stronger impact on collectivist individuals, and self-focused training was found to have a greater impact on individualists (Guzzo & Dickson 1996).

## 13. Team Climate

Team and organizational climate also affects a team's effectiveness and is a factor which is influenced by many other elements contributing to effective teamwork. Particularly in demanding, changing, and uncertain environments, such as healthcare, people must support one another to create climates of safety, confidence and empowerment (Borrill et al., unpublished). Despite the

recognition of its importance, scholars have struggled to develop a uniform definition of climate. Anderson and West (1998) draw on two main schools of thought: the *cognitive schema approach*, which defines climate as individuals' constructive representations of their work environments, expressed in terms of psychological meaning and significance, and the *shared perceptions approach* in which organizational climate is defined as shared perceptions of organizational policies, practices, and procedures.   Although these two approaches are compatible, the latter is favoured and therefore it could be said that the climate of an organization describes the collective employee perceptions of their organization: how employees experience organizations and attach shared meanings to their perceptions of it, especially in relation the processes, practices and behaviour which are rewarded and supported in an organization. (Anderson & West, 1998; Michie & West, 2004)

Michie and West (2004) highlight four dimensions of organizational climate which have been identified across a number of different work contexts by many scholars:

- Role stress and lack of harmony, (including role ambiguity, conflict and overload, subunit conflict, lack of organizational identification, and lack of management concern and awareness).

- Job challenge, autonomy and importance.

- Leadership facilitation and support (including leader trust, support, goal facilitation and interaction facilitation, and psychological and hierarchical influence).

- work group co-operation, friendliness and warmth, as well as responsibility for effectiveness (Michie & West, 2004, pp. 93-94).

In terms of effectiveness, if all but the first factors mentioned above come together to provide a climate in which organizational support and autonomy is high, it is likely to provide positive effects in terms of job performance. Job stress and lack of harmony, however, will not have positive effects unless the stress is qualitative, in which case team effectiveness can be enhanced (Drach-Zahavy & Freud, 2007).

In order to measure team climate for innovation, West et al. (1996) developed a four-factor model:

- Participative Safety (interpersonally non-threatening atmosphere and participation in teams),

- Support for Innovation (articulated and enacted support of attempts to introduce new and improved ways of doing things)

- Objectives (formerly Vision; clarity, visionary nature, attainability, and sharedness of team goals), and

- Task Orientation (shared concern with excellence of task performance).

From these four factors, West et al. (2005) developed the Team Climate Inventory through which to measure team effectiveness.

Gil et al. (2005) found that team climate is the nexus mediating between leadership and innovation. Evidence suggests that the higher the level of innovation in a team, the more likely it is that their team climate is characterized by shared vision, participation in decision-making, constructive management of

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conflict, tolerance of minority dissent, intra-group trust and safety, support for innovation and reflexivity (Michie & West, 2004). On the other hand, Pirola-Merlo and Mann (2004) found that although team climate does influence overall team creativity and innovation, it is via the creativity of individual team members, not directly from the team, and thus its level of influence depends on the level of the team members' creativity. Chen, Kirkam, Kanfer, Allen and Rosen (2007) focus on the significance of the leadership in creating a positive climate and their study of Fortune 500 branches shows that when team leaders create an empowering climate that encompasses the entire team, not just individual members, they are likely to be more effective. Interestingly, in Mostafa's (2005) study, educated male leaders were found to be most suitable for creating a climate suitable for innovation.

## 14. Resources

The term 'team resources' refers to two factors: appropriate team size for the task and financial, technical and material resources. In West and Anderson's 1996 study of 27 top management teams, it was found that resources were a great predictor of team innovation and thus effectiveness. Group size has been shown to affect the magnitude of several other factors: the general view is that larger groups tend to decrease members' liking for the group and team performance as group cohesiveness decreases (Mullen & Copper 1994). In addition, it allows "social loafing" as team members can take on fewer responsibilities and the amount of effort each member contributes to the group task decreases. Hackman argues that perhaps this is because each team member feels less responsible for the outcome than they do in smaller groups

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or in individual work (Hackman 1987). Thus, the team should be as small as possible for the task at hand (Hackman et al, 2000) and this can be achieved by having team members with appropriate skills and a good mix of people. West (1999) found that healthcare teams often consist of twenty, thirty or forty members, while most other sectors have teams of 12-13 members. He concurs with the above views that teams of this size lack communication and are less effective. Therefore, he feels they should be 'organizations' and that those running these organizations should be trained to do so.

Despite the fact that when team numbers are small, resources can be more limited, Katzenbach and Smith (2005) and West and Markiewicz (2004) add to the above argument by stating that teams of around 10-12 members function well. If a team is larger than this, there are too many conversations to be had and too much information to integrate and a risk of a herd mentality developing. Cohen and Bailey (1997) counter this argument by stating that having larger teams means that fewer leaders need training, less team coordination is needed and not so many team proposals need to be written. In addition, Le Pine, Piccolo, Jackson, Mathieu and Saul (2008) found that the relationship between teamwork processes and team performance was stronger where the teams tended to be large. However, as Hackman et al. (2000) state, one can overemphasize the benefits of larger teams at the expense of their coordination cost. In Lemieux-Charles and McGuire's (2006) review of healthcare teams, they found varying support for team size: sometimes larger teams have better patient outcomes while at other times, larger teams perceived

themselves as less effective and were less involved in participation indicating reduced team member satisfaction.

The provision of financial, technical and material resources is usually the responsibility of the team leader or the management. Since a team's motivation is often stimulated by the idea that what they are doing is worthwhile and can be done, if the team members see a group of people with the right skills for the task and if the support of key organizational members is present, this motivation is likely to increase (Shea & Guzzo, 1987). In addition, if organizational leaders are providing resources through money, training, technical expertise, and materials, they are likely to create a climate suitable for innovation and thus improve the team's effectiveness (Anderson & West 1998).

To conclude, through having the right number of people with the right skills and an organization which provides the team with the resources they require, teams become more effective.

### 3.2.2 Key Processes Dimensions and Components

Within the traditional input-process-output model of team effectiveness, the process element includes both social processes, such as trust and support, and task processes, such as constructive debate about task performance. As a result, team effectiveness can be influenced by the intervention of team processes (Guzzo & Dickson, 1996). Many psychologists disagree on the value of team processes: some believe that for the most part they impair group task effectiveness, while others feel that some team processes improve a team's effectiveness (Hackman & Morris, 1975). Le Pine et al. (2008) found that all

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team processes, regardless of which type, were positively associated with team performance and member satisfaction. Processes which were shown to be significant for delivering more effective patient care in a study of more than 500 NHS teams carried out by Borrill, West, Shapiro and Rees (2000) included clear objectives, high levels of participation, task orientation, support for innovation and reflexivity. Therefore, these processes, as well as conflict management, will now be discussed.

## 1. Objectives

Curral et al. (2001) believe that the most important factor in determining group effectiveness is the presence of clear, specific team goals and objectives as these have been shown to predict group performance outcomes. There are objectives for all aspects of team process, for example, learning objectives for the team members and instructional objectives in terms of team training. If these objectives are set, team performance is likely to increase. Even if team members assume individual goals, they must coordinate effort and provide assistance to other team members to meet higher-level team objectives such as coordinating collective effort, backing-up a teammate, or aiding a teammate in problem solving. The extent to which members give attention and effort to both individual and team goals is flexible but its impact is critical to team performance (Kozlowski & Ilgen, 2006).

As Antoni's (2005) study of 26 teams found, having team goals and goal commitment was a good predictor of group productivity and job satisfaction. Al-Rawi (2008) drew similar conclusions by looking at team cohesiveness, which he defined as commitment to common purposes, performance goals, and

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approaches for which team members hold themselves mutually accountable. In his study, he found that when team cohesiveness is low, levels of value and performance tend to decrease. NHS experience of teamwork training found that individual objectives were often made in annual appraisals but that team objectives were neglected. However, when teams did set objectives, while finding it challenging, they found the discussion of team values, differences in understanding and perceptions of the team and role division extremely useful (Benson & Rice, 2009). In summary, clarity of commitment and agreement to objectives aids team process and increases job satisfaction.

## 2. Reflexivity

West et al. (2004) coined the term 'reflexivity' in respect to team process to signify the extent to which a team collectively reflects its objectives (both general and specific), strategies, and processes and adapts them accordingly. It has been found that reflexive teams plan in more detail, pay more attention to long-term consequences and respond to their environment more (Widmer, Schnippers & West, 2009). West et al. (2004) identify three central elements to reflexivity:

1.  Reflection – is crucial for learning from experience as it allows teams to evaluate current practices and includes behaviour such as questioning, planning, analysis, diversive exploration, learning and reviewing past events with self-awareness (Widmer et al. 2009).
2.  Planning – Planning is seen as the bridge between reflection and action or adaptation. High reflexivity (and consequently innovation), exists when

team planning is characterized by greater detail, inclusiveness of potential problems, hierarchical ordering of plans, and long as well as short range planning, especially during the execution phase (Widmer et al., 2009; West et al., 2004)

3. Action or adaptation - implementation of plans for change developed through initial and subsequent reflection..

Developing environments in which reflexivity can be implemented is a challenge and several team characteristics have been identified which influence reflexivity (Widmer et al, 2009): there must be trust and psychological safety among team members; if they trust each other they will not be afraid of speaking freely. In addition the team must possess a shared vision, which will help create commitment to the team and foster risk taking and experimentation which requires reflexive behaviour. Tjosvold et al. (2004) combine these two characteristics by stating that there must be a level of confidence within the team and there must also be strong relationships and cooperation in order to allow teams to solve problems. Collective group goals are also key. Diversity is another significant team characteristic for reflexivity; members with different views will bring usefully differing perspectives on issues to the group which in turn may bring less obvious solutions to the team (Widmer et al., 2009).

West (1999) highlights six ways in which healthcare teams can instill or improve reflexivity:

1. Leadership: to create a safe atmosphere in which team members feel free to reflect, communicate, explore and take risks.

2. Introducing new team members: to reevaluate team composition and communication processes

3. Acknowledging errors, failures and successes: to learn from mistakes, to practice more safely and to learn and celebrate what works well.

4. Examine intra-team conflicts: to learn about the causes of conflict and to improve practice

5. Be aware of work overload: to reflect upon team functioning and external demands

6. Initiate organizational change: to reflect on organizational policies, objectives, procedures and support.

Schippers (2008) also highlights the importance of the team leader in influencing team processes like reflexivity. For instance, if the leader does not discuss errors within the team or only solves conflicts at short notice without considering long-term consequences, s/he might rather restrain the team from acting reflectively rather than facilitate reflective behaviour. What is more, the leader has to create the conditions for exploration, experimentation and risk-taking and can also influence team reflexivity more directly by encouraging the team to reflect on their objectives, strategies, and processes and stimulating their communication (Widmer et al., 2009).

Several scholars agree on the significance of reflexivity for team effectiveness as they believe it promotes focus and efficiency as well as improving both the subjective as well as objective measures of team performance (Tjosvold et al, 2004; Schippers, 2008). Carter and West (1998) found reflexivity to be beneficial: in their study of 19 BBC production teams they

found that reflexivity predicted team effectiveness and in a field study of 59 work teams they found that team reflexivity mediated the (moderated) relationship between diversity and team performance, commitment, and satisfaction. Meanwhile Edmondson (1999) studied 51 intensive care nursing teams and found that psychological safety was the most important predictor for team learning, a concept that forms part of reflexivity (Widmer et al., 2009). Schippers (2008) found high correlations between shared vision and reflexivity in a study among 59 school management teams, especially if the team leaders were inspirational. The influence of reflexivity has been found to be a particularly strong moderator between minority dissent, innovation and effectiveness as De Dreu (2002) found while studying 32 organizational teams performing complex, ill-defined tasks.

## 3. Interaction and participation

Team interaction and participation has been shown to lead to more effective, innovative teams and is essential for healthcare teams where failure to interact and participate can create problems for patients (Borrill et al., unpublished). This process includes participation in decision making, regular meetings and in creating a trusting, safe, supportive and communicative team environment. In his study of high performance work teams in Europe, Bauer (2004) found that higher worker participation led to higher job satisfaction. This particularly applied to workers' involvement in work systems which allowed them to increase autonomy over how tasks were performed and improve communication with co-workers.

The importance of the participation process is exemplified by Hackman and Morris (1975) who believe that through team members' on-going interaction process whilst working on a task, the "group effectiveness problem" can be understood. To outline this, they draw attention to two examples: on one hand, team members may not work together well at all and thus they will not share important information with each other; as a result, the quality of the outcome will suffer. On the other hand, a team may be well synchronized and may share comments and sometimes innovative ideas quickly and easily, thus leading to a truly creative outcome (Hackman & Morris, 1975). Several healthcare team studies have mentioned an imbalance of hierarchy as a reason for some team members not participating fully. In turn this has an influence on satisfaction, with higher status team members participating in more team interactions or being more satisfied with their relationships with coworkers and the level of autonomy (Lemieux-Charles & McGuire, 2006; Benson & Rice, 2009). Poulton and West (1993) concur with this view, stating that participation and cohesion can be achieved in healthcare teams by adopting a democratic management style and ensuring all team members are treated equally.

From these statements, it is clear that effective communication processes are highly beneficial. To achieve effective communication, good coordination and cooperation is necessary, factors which Kozlowski and Bell (2003) identified as key, interrelated behavioral processes. To assist the achievement of these behavioral processes, teams should hold regular meetings in which all members feel that they can contribute to decision making; they should trust their colleagues and feel safe and supported by them (Kozlowski & Ilgen, 2006).

Much social psychology research has focused its attention on identifying factors that eliminate uncooperative behavior and induce positive team cooperation, for example, making team member contributions visible and making their actions accountable, in other words: increasing their participation. As well as gaining from inherently good coordination and cooperation, communication can be regarded as a supporting tool for these behavioural processes, including decision making and problem solving (Kozlowski & Ilgen, 2006). Emphasizing team development, Morgan, Salas, and Glickman (2001) believe that a team's ability to communicate, coordinate and interact should increase over time to improve team performance. They feel that good communication supports both task work and teamwork as it facilitates interaction and social relationships as well as exchanging task-related information and developing team solutions to problems. Benson and Rice (2009) found that healthcare teams which held regular meetings and had good systems of communication were more effective than those that did not. Al-Tajam (2002) found similar results while studying Saudi public corporations: teams in which there was an absence of participation in decision making processes, and a resistance to development, caused internal fragmentation and reduced team functioning.

Hackman and Morris (1975) emphasize the significance of participation as a team process by indicating the number of team input factors that influence it. These include leader attitudes, member personality, team size, team history or experience and task type. In addition, it can affect elements of team performance, especially in terms of task solution. Thus, it can be concluded that

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participation in decision making, communication, regular meetings and creating a safe, trusting and supportive environment is highly important for predicting team effectiveness.

## 4. Task focus

Having a team which is focused on the task at hand is also an influential factor for successful team processes and is linked to many other inputs and processes. For example, West et al. (2004) found that if teams were strongly focused on a task, then levels of demographic diversity seemed to promote innovation, while highly demographically diverse groups had low levels of innovation. Morgensen et al. (2005) look at task focus from the view point of individual team members highlighting conscientious individuals as those who are likely to avoid social loafing and free riding in teams and who are likely to be highly task focused. This is due to their self-discipline and dependability which also works to build a team climate that fosters personal accountability and norms counter to time-wasting behaviour (Morgeson et al, 2005). Mullen and Copper (1994) also found that commitment to task worked to increase the cohesiveness-performance effect more than interpersonal attraction or group pride.

From these examples, it can be seen how interrelated team focus is to team inputs and to creating innovative outcomes, thus indicating its mediatory role. In addition, Castka, Baber, Sharp and Belohoubek (2001) found that team performance improved when team members were focused on task goals and reduced when teams had no focus. Forrester and Tashchian (2006) found the same result when studying student work teams: task focus and cohesion led to

higher team effort, effectiveness and satisfaction. Thus, to ensure task focus is maximized, team members must be patient/client focused, must be concerned with quality and must have constructive debate about their performance and strategies to minimise or manage any errors.

## 5. Team Conflict

Conflict within teams is almost inevitable be it due to personality clashes or due to different views towards the team's task. Trimmer Van Slyke and Cheney (1999) label these two conflict types as, *affective* or interpersonal conflict and *substantive,* task-oriented conflict. The impact of these two different conflict types on team outputs varies significantly.

Many scholars (Trimmer et al., 1999; Jehn, 1997) agree that affective conflict is counter-productive when assessed in terms of the team's task and that conflicts based on personal issues harm team performance. The reason affective conflict harms a team's performance is because it draws team effort, time and energy away from the task at hand since interpersonal squabbles are not related to the job. Also, if affective conflicts are left unresolved, they may lead to communication barriers among the team members and in turn, these barriers may hamper efforts to settle substantive disagreements and encourage the team to work interdependently. Mohammed and Angell (2004) however found that affective conflict negatively predicted perceived overall performance, but it did not affect the objective performance in their study of 45 student teams; instead it reduced team member satisfaction. Team members can reduce the impact of affective conflict by learning to recognize it, differentiate between it

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and substantive conflict and learning to deal with the conflict in a positive way (Trimmer et al. 1999; Jehn, 1997).

Task-related conflict, which arises from the different perspectives of the team members, however, has been found to enhance the team's performance (Trimmer et al., 1999). Rupar (2007) agrees with this view stating that task-related conflicts can facilitate better problem solving as it means solutions will avoid group-think; they will be built on the gathered ideas, opinions and desires of members, combining their differing perspectives which are then harmonized to create a collective solution. Conflict has been found to be useful to healthcare teams when task related as it may lead team members to re-evaluate the status quo and adapt their objectives, strategies or processes more appropriately to their situation, although if excessive, it will inhibit team member and team effectiveness and innovation (Borrill et al., unpublished).

De Dreu and West (2001) focused their research on minority dissent defined as when a minority in a group, either an individual or several individuals, opposes the beliefs, attitudes, ideas, procedures, perspectives or policies of the majority. Through their research on the national postal service and other organizations, they found that minority dissent was associated with team innovation in teams which possessed high levels of participation in decision making, but not otherwise (De Dreu & West 2001). Therefore, one could say that substantive conflict is one of the benefits of teamwork over individual work and that better outputs may be produced in teams that experience substantive conflict than those produced by more homogeneous teams (Trimmer et al., 1999; Rupar, 2007; Kozlowski & Ilgen 2006).

However, Jehn (1997) warns that substantive conflict can turn into affective conflict: for example, if members cannot agree on task issues, they may begin to dislike other team members and attribute the task conflict to personality issues. Kozowlski and Ilgen (2006) share the view that if conflict comes to interfere with team information processing—diverting attention, increasing cognitive load, and limiting flexibility—it will degrade team performance. In addition, counter to most scholars, Passos and Caetano (2005) found no relationship between both substantive or affective conflict and team performance.

Trimmer et al. (1999) feel that teams often avoid any conflict entirely which may hinder performance. Thus, they feel that teams should be trained in methods such as dialectical inquiry in which teams analyze an alternative proposed solution to a problem which they must discuss and adapt via consensus. Jehn (1995) also considers that team communication norms impact on the effect of conflicts: if there is a team climate in which matters can be discussed freely and members' opinions can be heard, the negative effect of conflicts is likely to decrease. In addition, a study by Simons and Peterson (2000) showed the significance of team trust as a moderating tool for team conflict because it helps team members tolerate task conflict without it becoming destructive relationship conflict.

Meanwhile, Hempel, Zhang and Tjosvold (2009) see the relationship between trust and conflict the other way around: their study found that cooperative, open and constructive conflict management in teams helps to build team trust as it convinces team members that they can rely upon each other for

concern and caring. As a result, team performance is increased. In contrast they found that teams who adopted competitive conflict management had lower levels of team trust: the win-lose nature of this type of conflict management communicates that teammates are pursuing their own interests. This view was supported by another similar study in which it was found that positive approaches to conflict contribute to strong relationships in the team, which in turn lead to increased team effectiveness and employee citizenship (Tjosvold, Hui, Ding & Hu, 2003). Marks et al. (2001) identified two strategies for managing conflict within teams:

1. Preemptive: establishes conditions to prevent, control, or guide team conflict prior to its occurrence.

2. Reactive: resolve conflicts once they manifest themselves by working through task, process, and interpersonal disagreements among team members.

Research on the effectiveness of these approaches, however, still needs to be conducted. Dreu and van Vianen (2001) consider that if task conflict is dealt with through collaboration (rather than confrontation or contending) individual and team effectiveness is likely to improve. However, relationship conflict is much more difficult to deal with and if dealt with through collaboration, team effectiveness is likely to decrease. In fact, an effective approach to dealing with this kind of conflict is to avoid responding to it and focusing on the task at hand instead. Somech et al. (2009) concur with this view, having found that teams which adopt cooperative conflict management methods are much more effective than those which adopt confrontational conflict methods. Part of the

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reason for this is due to the climates which the two create: confrontational conflict management can make team members feel isolated and lose faith in the team, whereas cooperative conflict management allows the team members to discuss their ideas and in turn become more innovative, thus improving their performance. A Clinical Teams Project conducted in UK healthcare teams carried out training in conflict management. They found, however, that it was the other training the team members received that they found most useful in resolving conflict and turning it into something productive. Such training included people working together in workshops, team get-togethers, working on agreed collective action plans, understanding team member roles, exploring values, managing meetings effectively, setting objectives and exploring similarities as well as differences (Benson & Rice, 2009).

Behfar, Peterson, Mannix and Trochim (2008) add to the above studies as they found that teams with consistently high/increasing performance and team member satisfaction adopted conflict management techniques which focused on a "dual concerns" approach. This means having concern for both their task and for integrating the interests of individual members by finding an appropriate way for all members to contribute and solidly understand the compromises and trade-offs all participants made in planning how to prevent potentially destructive conflicts. Teams that were only successful in performance, and not satisfaction however, focused more on creating rules and structures in reaction to conflicts to avoid the disruption of performance goals.

Looking at team conflict from the leadership point of view, Schermerhorn, Jr., Hunt, and Osborn, (2002) feel that team leaders and managers must be

comfortable in dealing with interpersonal conflict and to be able to recognize situations in which conflict may develop and find the best solutions in order to facilitate conflict management. In terms of task-related conflict, effective managers should be able to change a potentially destructive conflict into a constructive one. This would result in positive benefits to individuals, the group or the organization by utilizing the event as an opportunity for creativity, for sharing more ideas and for improving team performance and satisfaction. Interpersonal conflicts need to be handled differently: managers must be alert to them and take quick action to eliminate or minimize their disadvantages which include decreases in productivity and job satisfaction.

To conclude, team conflict is highly likely to occur at times however, constructive task-related conflict can improve patient care and team processes while personal conflicts are usually destructive.


## 6. Creativity and Innovation

Creativity and innovation is an important process for team effectiveness because it increases the ability of an organization to focus its resources effectively, appropriately and more quickly than its competitors, by permitting all members within an organization to react to demands for change, and to make appropriate changes at a local level (West et al. 2004). This is particularly appropriate for healthcare organizations where healthcare treatments and processes are often changing, thus forcing organizations to innovate to be up to date (Xyrichis & Lowton, 2008).

Creativity and innovation processes are heavily influenced by team inputs and heavily influence the success of team outputs. In addition, they are linked to each other: West et al. (2004) describe creativity as the development of ideas, and innovation as the development and application of ideas in practice. Creativity can thus be seen as part of the innovation process (West et al. 2004). With this definition in mind one could say that creativity is generating new, improved ideas while innovation is implementing them. Thus, creativity can be seen as the beginning of innovation (Gilson & May, 2005).

To see the link between creativity and innovation, Gilson and May (2005) highlight aspects usually found in the team innovation process:

1) Identification or recognition of a problem

2) The generation of creative ideas by individuals

3) Proposal of those ideas to the team

4) Discussion and development of those ideas by the team

5) Evaluation of those ideas by the team

6) Implementation of accepted ideas by the team.

West et al. (2004) explore the links between innovation, inputs, processes and outputs. They feel that the following team inputs have a large influence on the level of team innovation:

1. The team task must have intrinsically and extrinsically motivating characteristics

2. The team's composition must be suitable for innovation including team member personality, skill and demographic diversity

3. The organizational context must have rewards, learning and development practices, and a climate open to innovation.

While being a team process itself, other team processes also influence the level of innovation in a team and many of these factors have already been mentioned. They include leadership, task focus, reflexivity, intergroup relations, conflict, and dissent (Curral et al 2001). Other scholars, such as Guzzo & Shea (1992) and Pearce and Ensley (2004), also share these views, stressing that having shared, clear goals and visions are crucial for the innovation process as it makes the team more task-oriented. In addition they state that having divergent views and perspectives and an environment supportive to innovation or where innovative attempts are rewarded rather than punished are important for developing creativity and innovation. Meanwhile, in their study of private Chinese enterprises, Boa, Yang, Xie and Zhou (2004) found that trust and commitment are highly important for creating innovative teams. Ford and Sullivan's (2004) study considered the importance of timing for innovative ideas: if innovative ideas are shared at the beginning and the first half of a project, they have a positive impact. However, if these occur in the second half, they have a negative affect as they destroy team focus. Finally, in terms of outputs, the impact of the innovation can be measured in relation to its radicalness, magnitude and novelty and these elements can be increased if there is a supportive climate for innovation (West et al, 2004).

## 7. Leadership Process

Since its entire purpose is about the effectiveness of teams, groups and organizations, leadership has an immense impact on team performance be it

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from within or outside the team. While good leadership allows healthcare organizations to thrive, promotes team effectiveness and enhances the well-being of team members, bad leadership degrades the quality of life for everyone affected by it and creates a poor working environment. Members of a primary healthcare team in England rated their effectiveness more highly when they had strong leadership and high involvement of all team members (Oandasan et al., 2006), and medical teams became frustrated and made poor decisions when leadership was lacking (Xyrichis & Lowton, 2008). It is how leader behaviour and personality is perceived that influences how a team performs, how satisfied its members are and how effective a leader is (Hogan & Kaiser, 2005; Ayman & Chemers, 1983). As organizations have shifted to the use of teams, leadership roles have also changed and as Ahearn et al. (2004) state, leaders were once seen as overseers but now, their role is much more that of a coach or facilitator providing coordination of efforts, elimination of barriers and orchestration of worker skills, talents, and motivation (Ahearn et al, 2004, p. 310).

In terms of team effectiveness, team leaders adopt different patterns of behaviour. These include establishing the team's structure and purposes, ensuring the team has the resources it needs and also that any obstacles are removed. These are in addition to assisting individual members in strengthening their own contributions to the team, and working with the entire team to help members harness their collective resources well in the pursuit of team objectives (Hackman & Wageman 2005). The attention to which leaders pay to these different factors varies depending on what leaders see as most important for a particular team.

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Flood et al. (2000) identify four main types of leadership which are influenced by a leader's personality:

1. Authoritarian leadership: autocratic leaders often impair the quality of information processed and its exchange with the rest of the team. Team members tend not to assert their positions or share their ideas if they have an autocratic leader

2. Transactional leadership: Transactional leaders use rewards as their primary tool and they relate to their team through rational exchanges that enable each to reach their goals. When the exchange (or reward) meets the team member's needs, they will comply.

3. Transformational leadership: Transformational leaders tend to inspire their subordinates to do more than originally expected and to work for goals that go beyond immediate self-interests and are for the greater good. In addition they inspire their employees to look at old problems in new ways (Flood et al, 2000; Garg & Rastogi, 2005).

4. Laissez faire leadership: Unlike transformational and transactional leaders, the laissez faire leader avoids decision making and supervisory responsibility (Flood et al, 2000, pp. 403-404).

Authoritarian and laissez faire leadership tends to have a negative effect on team members' perceptions of team effectiveness: Laissez faire leaders fail to give a coherent direction or strategic focus so team members are likely to view teamwork negatively. Meanwhile, authoritarian leaders are unlikely to be suitable for teams in fast-paced environments and are likely to reduce team cohesion, although, in the case of medical teams, authoritarian leaders may be

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more effective when trauma severity is high (Yun et al., 2005). On the other hand, due to an improvement in team climate and through the process of social exchange, transactional leaders are likely to produce a cohesive, effective team. Transformational leaders are also likely to see positive and significant results as their team members are continuously united through their team vision. In addition, the latter two leadership types are more likely to adopt consensus decision making which is known to improve implementation and thus team effectiveness (Flood et al, 2000; Kuo, 2004).

The influence of these leadership types on the collective personality, and thus in turn collective performance, was studied by Hofmann and Jones (2005) in their analysis of 68 pizza delivery teams and worked to reaffirm the views stated above. In addition, Eisenbeiss, van Knippenberg and Boerner (2008) carried out a study of 33 research and development teams and confirmed that transformational leadership is instrumental in team innovation but that it is not sufficient to stimulate team innovation: team innovation is only enhanced when climate for excellence is high, in other words when team members share a concern for high-quality performance.

One can also consider the influence of shared leadership in which the team leader and team members share the responsibilities for the task. If teams adopt this approach, they are likely to have high team effectiveness and operate as high performance teams (Pearce & Sims, 2002). Mehra, Smith, Dixon and Robertson (2006) focus on shared or decentralized leadership. Their results found varied levels of influence on team performance depending on leadership structure and team composition. Meanwhile in a study of 20 work teams

Solansky (2008) found that shared leadership gives teams confidence, satisfaction, ownership and motivation because through it, team members become part of the creation and maintenance of team processes and objectives.

In addition to the above leadership types, there are also different aspects of leadership. These can be divided into 3 overall categories: leading, coaching and managing.

### a. Team Leading

Leading involves the team leader setting clear long-term team objectives; ensuring the team has all the resources and organizational support required, and supporting team member ideas for innovation (West et al., 1998). As discussed above, transactional and transformational leaders are more likely to create environments in which team members' ideas are listened to and where innovation is encouraged. In addition, leaders creating a compelling, clear and challenging sense of direction for a team task allow team members to be inspired to find the means needed to reach this goal (West et al., 2004). The importance of sharing common goals and perceptions between leaders and teams is highlighted by Gibson, Cooper and Conger (2009) who focus on leader–team perceptual distance. This is when there are differences in the perceptions of leaders and teams. They found that differences in perception can create precarious situations, especially for goal accomplishment and constructive conflict and that performance was found to be higher for these factors when perceptual distance was low.

Team members should be supported by their leaders by being given appropriate resources in terms of training, technical expertise, money, materials,

guidance for improving effectiveness and organizational support (Hackman, 2002 and Carter, West, Dawson & Scully (unpublished)). Leaders should create an environment in which team member ideas are listened to: rather than sharing their opinions hastily, leaders should delay offering their opinions since team members are likely to accept them quickly and leaders should facilitate accurate, open communication and discussion within the team (West et al, 2004). Finally, leaders should be clear in the team processes they develop as this is associated with clear team objectives, high levels of participation, commitment to excellence, and support for innovation (West et al., 2003).

## b. Team Managing

Team leaders also have the role of managing their teams by clarifying clear objectives and roles and monitoring performance (West et al., 1998). Leaders must ensure that organizational and team objectives work together and that these objectives are clearly presented to the team and organization. In fact, in a study of 26 teams, Antoni (2005) found that management by objective systems can be an effective tool to improve group effectiveness in respect to both group productivity and job satisfaction, especially in relation to self-managed teams. Team members' unique roles must also be defined to ensure that the team organizes its activities effectively and that all team members work cooperatively and have the opportunity to contribute to decision making. These roles must provide team members with the opportunity for growth and development and value their work as effective and meaningful. This is particularly important for healthcare teams where there is a core team that works together every day and has other, peripheral participants who join the

team every now and again but are not full team members, for example oncologists in breast cancer care teams (Borrill et al, unpublished).

To monitor performance and evaluate individual contributions, they must check the work progress and quality against target plans and reward good performance and give helpful feedback. These processes will help individuals clarify their work objectives, feel valued, respected and supported, thus increasing the team's performance, innovation and well-being (West, 2004).

### c. Team Coaching

Team coaching is when leaders help manage day to day interactions and processes within the team (West et al., 1998). It can be defined as 'direct interaction with a team to help them coordinate their collective resources to be task-appropriate' (Hackman & Wageman, 2005). Leaders should be available to discuss problems and stressful situations, to help solve them by encouraging teams to use their collective resources and to look at them from different perspectives, and to learn from their mistakes. They must be aware of the individual team members' needs, competencies and goals in order to motivate the team members to pursue the collective team goals and to strengthen their personal contributions to the team (Fuqua & Newman, 2004; Hackman & Wageman, 2005).

Leaders can also introduce coaching interventions for 3 performance processes:

1. To encourage motivational, collective team effort
2. To address performance strategy through consultation

3. To address the educational developmental aspect of team member knowledge and skills.

It is important that these interventions are implemented at appropriate times in a team's life cycle for them to be effective:

- At the beginning the team should receive a motivating intervention to boost the start of the project.

- At the midpoint, interventions are often useful for team members to assess their work progress, and to review and amend their efforts and task performance strategies.

- At the end, educational coaching interventions are often appropriate to build on the team's talents, the personal development of individual members and to increase future performance capabilities (Hackman & Wageman, 2004).

For a leader to be able to coach a team successfully, they must be able to listen, recognize and reveal feelings, give feedback and agree on team goals (West, 2004). To sum up, team leaders and managers within organizations have three principal responsibilities to their teams: to lead them, to coach them and to manage them. Regardless of which form of leadership is being conducted, leadership clarity has been shown to be essential for creating effective teams, especially in terms of setting clear team objectives, high levels of participation, commitment to excellence and support for innovation (Borrill et al, unpublished).

## 3.3 Conclusion

This chapter has reviewed the significance of many factors of team functioning, thereby confirming their significance for predicting team effectiveness. Hence this research will adopt the ATPI measure (which includes the factors that influence team effectiveness in a detailed questionnaire).

What this review does not tell us is whether or not these variables are effective in the Jordanian context. Therefore, this research aims to contribute in two ways. Firstly it will test the psychometric properties of the ATPI measure, which includes many variables for measuring team effectiveness, in both British and Jordanian healthcare teams. Secondly it will measure the team effectiveness of the Jordanian healthcare teams, using the ATPI measure to assess team functioning from the members' point of view and using leader ratings to assess team effectiveness from the leaders' perspective. In so doing, this research will answer the principal question: "which factors predict the effectiveness of healthcare teams?" Several hypotheses will be tested which will be described in the following chapter.

# CHAPTER 4

## THEORETICAL BACKGROUND AND HYPOTHESES

### 4.1 Chapter Overview

This chapter presents the theoretical background and proposed hypotheses which will be tested in this research based on a review of previous models of team effectiveness and their different variables.

### 4.2 Theory and Research Hypotheses

Figure 1 shows a model of the anticipated relationships between inputs, processes, leadership, effectiveness and innovation.

FIGURE 1

The Anticipated Relationships between Input-Process-Output
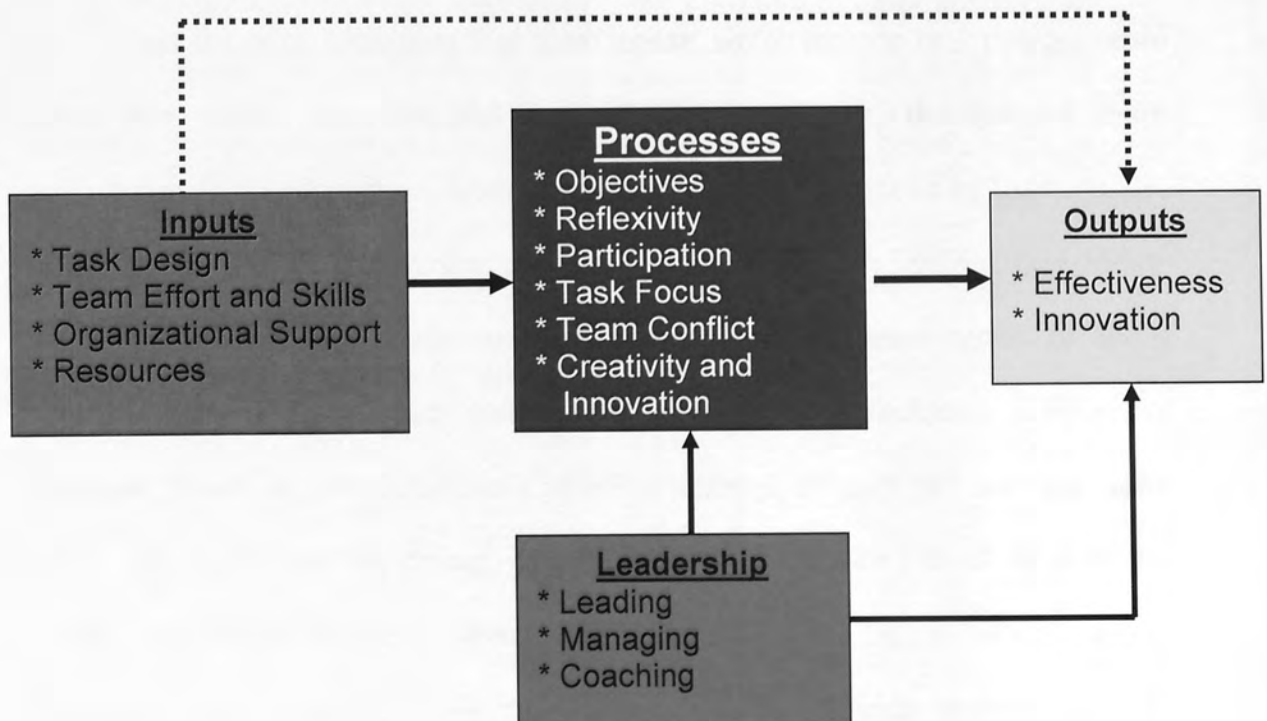
According to the model, which is based on the input-process-output model, processes and leadership mediate relationships between team effectiveness and innovation. This research also offers predictions about how team inputs relate to team processes, how processes relate to team effectiveness and innovation, how leadership relates to processes and how leadership relates to team effectiveness and innovation. The following sections will discuss the relationships mentioned above.

### 4.2.1 The Relationships between Team Inputs and Team Processes

Almost every model developed to explain team effectiveness (e.g., Cohen & Bailey; Gladstein, 1984; Guzzo & Shea, 1992; Hackman, 1987) is grounded in MaGrath's basic proposition in that inputs, such as team characteristics, combine to affect team processes, which in turn influence team outputs.

This research proposes that team inputs, which include task design, team effort and skills, organizational support and resources, will predict team processes. Team processes describe factors that are influenced by team inputs. The team processes factors are: objectives, participation, reflexivity, task focus, team conflict, and creativity and innovation. The different types of team processes were researched extensively for example; Hackman (1987), for example, refers to process criteria of effectiveness, so that groups with team spirit work harder for the group, whereas Guzzo and Shea (1992) refer to the social interaction process where effectiveness may be enhanced when members have positive social interaction. Tuckman (1965) found cohesion, conflict, cooperation and communication to be significant group processes,

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which, as Yang and Tang (2004) concur, are very much related to differential team performance. Taggard and Brown (2001) show that there is a statistically significant relationship between team members' behaviour and team performance (e.g., participation and involving others, goal setting, feedback, team commitment, reaction to conflict, addressing conflict, averting conflict and communication). Obviously understanding the process through which team composition is related to team effectiveness is important.

The team task is central to its work as it influences what the objectives are and how it will function, for example in healthcare teams the task is an action, a decision or the provision of a health service. Usually, it is the responsibility of the team leader to design a clear task to ensure effective work (Oandasan, Baker, Barker, Bosco, D'Amour, Jones, Kimpton, Lemieux-Charles, Nasmith, Rodriguez, Tepper & Way, 2006).

In order for a team to operate effectively, it must have a clear task design which depends directly on the objectives which the team members seek to achieve. The task design should be well-aligned with the team's purpose and high in what Hackman and Oldham (1980) call motivating potential. This means that the team task is a holistic and meaningful piece of work for which members share responsibility and accountability (Hackman et al., 2000). The success of the impact of task design in achieving the objectives depends on the accuracy of the distribution of tasks among team members and therefore, the role of each member in the team should be defined (Stewart & Barrick, 2000). Campion, Medsker & Higgs (1993) confirmed that success in task design contributed to achieving a high level of productivity through the achievement of team

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objectives, which lead to a high level of satisfaction among team members. The importance of flexibility in team task design must be emphasised as it needs to be amended in accordance with any change in team objectives, team member skills, knowledge, and expertise, or the work environment, whether internal or external (Campion et al,1993). Overall, based on the preceding arguments, this research proposes that when the team has a complete, challenging task and the autonomy to achieve it then they are more likely to be motivated to set clear goals and try to achieve them. Thus, the following hypothesis will be tested in relation to this process:

Hypothesis 1a: Task design will predict team objectives

One element of task design is feedback on performance because reflexive teams plan in more detail, pay more attention to long-term consequences and respond to their environment more (Widmer, Schnippers & West, 2009). In addition, reflexivity in teams with clear goals and tasks can keep teams focused and efficient as well as improving both the subjective as well as objective measures of team performance (Tjosvold et al, 2004; Schippers, 2008). Therefore, this research proposes that good task design can impact the quality of reflexivity. The following hypothesis will therefore be tested:

Hypothesis 1b: Task design will predict team reflexivity

Another element of task design is interdependence. If interdependence is absent from a team then they are likely to serve more as a group of individuals than as a whole (Kozlowski & Bell, 2003). Good communication supports both task work and teamwork as it facilitates interaction and social relationships as

well as exchanging task-related information and developing team solutions to problems (Morgan, Salas & Glickman, 2001). Sprigg, Jackson and Parker (2000) conducted research among 5 UK based wire rope manufacturing teams and found that in teams where task interdependence is low, autonomy often resides within individuals, therefore there is little group cohesion and as a result, little job satisfaction. Accordingly, this research proposes that, as one element of task design, interdependence will lead team members to a high level of participation and communication in order to make the right decisions about how their task is achieved. The following hypothesis will thus be tested:

Hypothesis 1c: Task design will predict team participation

Task design also influences team task focus: having a team which is focused on the task at hand is an influential factor for successful team processes and is linked to many other inputs and processes. Castka, Baber, Sharp and Belohoubek (2001) found that team performance improved when team members were focused on task goals and reduced when teams had no focus. This research therefore proposes that when the team has a clear and challenging task and autonomy to fulfil it, the team members will be more likely to focus on the task and debate how best to fulfil it in a constructive way. As a consequence of this, the following hypothesis will be tested:

Hypothesis 1d: Task design will predict team task focus

Literature shows that effective task design including high levels of autonomy, interdependence and clear objectives are associated with team innovation. Guzzo and Shea (1992) and Pearce and Ensley (2004), assert that

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having shared, clear goals and visions are crucial for the innovation process as it makes the team more task-oriented, thus improving task focus. In addition they state that nurturing divergent views and perspectives and a climate in which there is support for innovation or where innovative attempts are rewarded rather than punished is important for developing creativity and innovation. Accordingly, this research proposes that if teams have a challenging task with clear objectives and the autonomy with which to complete it, task design might predict creativity and innovation. It will therefore test the following:

Hypothesis 1e: Task design will predict team creativity and

innovation.

Another significant input factor which influences team processes is team effort and skills. Bell's (2007) analysis of 89 different sources emphasised the importance of team effort and skills; the relationships between team composition variables including personality and skills indicated that factors such as team conscientiousness, agreeableness and collectivism influenced team performance. Thus, the effectiveness of team effort and skills is influenced by team member motivation and appropriateness of team member skills. If teams possess the appropriate effort and skills, they are more likely to work in an integrated and effective manner. West et al. (2004) argued that obtaining the appropriate level of team effort and the correct team skills are essential aspects influencing team performance and effectiveness (West et al., 2004). In order to achieve team objectives, team members' effort and skills must be combined. Even if team members assume individual goals, they must coordinate effort and provide assistance to other team members to meet higher-level team objectives

such as coordinating collective effort, backing-up a teammate, or aiding a teammate in problem solving. The extent to which members give attention and effort to both individual and team goals is flexible but its impact is critical to team performance (Kozlowski & Ilgen, 2006). To conclude, it is proposed that team effort and skills influence the clarity of team objectives and so the following will be tested through this research:

Hypothesis 1f: Team effort and skills will predict team objectives

Team effort and skills which influence reflexivity include trust, shared vision and goals, strong relationships and good cooperation (Widmer et al, 2009;Tjosvold et al.,2004). Possessing these skills will allow teams to solve problems and there should be collective group goals. Reflection is very important for effective teamwork as it allows teams to evaluate current practices and includes behaviour such as questioning, planning, analysis, diversive exploration, learning and reviewing past events with self-awareness (Widmer et al. 2009). Therefore, this research posits the view that if teams possess the appropriate effort and skills to set common goals and work together, they are also more likely to reflect on their work. Thus, it will test this hypothesis:

Hypothesis 1g: Team effort and skills will predict team reflexivity

Possessing the right team effort and skills also has an impact on team participation. A key skill for good participation is team potency. This is when the team has the right mix of skills and has the optimum level of motivation and self belief to get the job done. Guzzo and Shea (1987) define potency as "the collective belief of group members that the group can be effective". A team's

level of potency depends on the group's belief that they have what it takes to succeed; this could be skills, training, money and feedback. Feedback seems to have quite an influence on potency and performance: if a team receives positive feedback, the level of potency is likely to increase and in turn, so will its performance. Guzzo and Dickson (1996) feel that team potency is a highly motivational factor: if a team believes it can achieve something, it will be motivated to succeed. Team optimism and potency are especially significant for increasing team effectiveness when teams are newly formed (West, Patera and Carsten, 2009). Higher levels of team potency and self-leadership are also interlinked, and together they indicate higher team commitment and interaction (Bligh & Pearce, 2006). Teams with greater autonomy and self-leadership require more interaction: Cordery, Mueller and Smith (1991) research into mineral processing plants in Greenfield, Australia found that teams with decision-making responsibilities possessed more favourable employee attitudes than non-autonomous work teams. Accordingly, this research proposes that when the team has the right mix of skills, a high level of team potency and self-leadership, the interaction between team members and participation in decision making and information sharing will improve. Therefore the additional hypothesis will be tested:

Hypothesis 1h: Team effort and skills will predict team participation

Having a team which is focused on the task at hand is also an influential factor for successful team processes and is linked to team effort and skills. Castka, Baber, Sharp and Belohoubek (2001) found that team performance improved when team members were focused on task goals and reduced when

teams had no focus. This research further proposes that the motivation that teams have to get job done and belief in their ability to achieve goals, makes it more likely for them to focus on the task and to engage in constructive debate about how best to do the job. Correspondingly, the following hypothesis will be tested:

Hypothesis 1i: Team effort and skills will predict team task focus

In a working environment, conflict, which is an opposition or discrepancy between the ideas, beliefs or interests of the team members, sometimes emerges. Discussions and disagreements are common when several people work together and have to explain their opinions and defend their standpoints. Research conducted at group level has found that there are two types of conflict: *task* conflict and *social* conflict (Jehn, 1995; Van Vianen and De Dreu, 2001). Task-related conflict, which arises from the different perspectives of the team members, however, has been found to enhance the team's performance (Trimmer et al., 1999). The cause of conflict can be related to differences in personalities, perceptions, values, attitudes, needs, expectations, and resources. Proper skills in dealing with conflict can assist team members with handling and effectively resolving conflicts. They must possess the ability to recognize desirable and undesirable team conflict; to identify the type and source of conflict and to implement a resolution strategy via integrative approaches to negotiation. Skills that also influence the impact of team conflict are collaborative problem solving and communication (Stevens & Campion, 1999). Accordingly, this research posits the view that if the team applies the

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above skills to their work, the level of interpersonal conflict will be reduced, thus improving performance. So therefore the following will be tested:

H1j: Team effort and skills will predict low conflict

Creativity and innovation processes are heavily influenced by team effort and skills inputs and, in turn, they influence the success of team outputs. At the team level, creativity can be viewed as a means of identifying problems, using guesswork, developing hypotheses, communicating ideas to others, and contradicting what would normally be expected (Torrance, 1998). Furthermore, the willingness to invest effort and engage in creative work processes - especially in interdependent teams - was found to be critically important in a case study of project engineers working on a telecommunications project (Kazanjian, Drazin & Glynn, 2000). West et al. (2004) explore the links between innovation, inputs, processes and outputs. They feel that the team's composition is crucial to its success in regard to creativity and innovation. Members' personalities, skills and demographic diversity are all key variables. It is therefore proposed that having the skills and investing the effort in new ideas to improve ways of working, influences the level of creativity and innovation in a team. The research will therefore put the following hypothesis to the test:

Hypothesis 1k: Team effort and skills will predict team creativity and innovation.

The third input factor which influences team processes is managerial and organizational support. This is particularly influential for participation, reflexivity and conflict. Team effectiveness in healthcare has been found to be higher when organizations value teams and provide them with good resources and

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support as it can motivate health professionals to practice collaboratively (Fedor, Ghosh, Caldwell, Maurer and Singhal, 2003; Xyrichis & Lowton, 2008; Oandasan et al., 2006).

Hackman and Morris (1975) emphasize the significance of organizational support and participation as a team process as the leader attitudes, team experience, appropriate skills and organizational support were found to influence team motivation and participation, and thus in turn, team performance. For team members to participate effectively, organizations must provide appropriate education and training for teams to ensure team members can contribute most effectively. In addition teams need information about what is happening in the organization, such as changes in strategy or policy (Borrill et al., unpublished). Al-Tajam (2002) found, in his study of Saudi Arabian public corporations, that teams which lacked participation in decision making processes, and a resistance to development, resulted in internal fragmentation and reduced team functioning, indicating just how important it is.

Organizational support, in terms of reflexivity and feedback, has also been found to influence team performance: In Fort and Voltero's (2004) study of maternal nurses in Armenia, they found that receiving performance reviews was among the most influential factors for team performance.

Managers can reduce the impact of conflict by ensuring support through effective communication so that competition and conflict between different teams in an organization do not result, thus indicating the importance of support from higher levels (Campion & Higgs, 1995).

Overall, communication from the organization is a highly influential element of organizational support impacting team participation, reflexivity and conflict. To improve communication within teams, several studies have identified effective, regular meetings as a useful tool (Xyrichis & Lowton, 2008): In an NHS guide to developing and sustaining effective teams, team meetings were identified as important not only for communication, but for team participation in decision making, reviewing progress towards objectives, recognizing achievements, reviewing how the team is working together and team innovation (Benson & Rice, 1999). It follows, therefore, that this research will argue that organizational support influences the level of participation a team may have in terms of decision-making, engagement and communication. Furthermore, the level of dedication to reflexivity - including information made available to team members and the amount of time given to performance feedback and listening to team member opinions - influences team performance and reduces the risk of conflict. The following hypotheses will consequently be tested:

Hypothesis 1l: Organizational support will predict team reflexivity

Hypothesis 1m: Organizational support will predict team participation

Hypothesis 1n: Organizational support will predict lower team conflict

The final input factor influencing team processes is resources provided by the organization. The provision of financial, technical and material resources is usually the responsibility of the team leader or the management. Since a team's motivation is often stimulated by the idea that what they are doing is worthwhile and *can* be done, if the team members see a group of people with the right skills for the task and see that the support of key organizational

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members is present, this motivation is likely to increase (Shea & Guzzo, 1987). In addition, if organizational leaders are providing resources through money, training, technical expertise, and materials, they are likely to create a climate suitable for innovation and thus improve the team's effectiveness (Anderson & West 1998). Accordingly, this research proposes that if teams are provided with the appropriate resources, they will have more space and opportunity to innovate. In addition it will reduce the risk of conflict caused by a lack of resources. For these reasons, the following hypotheses will be put to the test:

Hypothesis 1o: Resources will predict low team conflict

Hypothesis1p: Resources will predict team creativity and innovation

### 4.2.2 The Relationships between Team Processes and Outputs

The relationship between team processes and outputs has been discussed extensively in the work team literature (Hackman, 1987; Sundstrom et al., 1990). Team processes describe team activities that organise task work in pursuit of goals (Marks et al., 2001). That is, team processes are the vehicles that transform team inputs to team outputs. In fact, typical team process variables such as communication and cooperation are often considered as predictor variables of team effectiveness (Campion, Papper, & Medsker, 1996; Cohen, Ledford, & Spreitzer, 1996; Hyatt & Ruddy, 1997). Moreover, this research expects that team processes which include team objectives, participation, reflexivity, task focus, team conflict, and creativity and innovation will predict team outputs in terms of team effectiveness and innovation. These variables will therefore now be discussed.

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First, the most consistently important processes factor in determining team effectiveness is the existence of team objectives (Guzzo & Shea, 1992). The clarity or specificity of goals has been shown to predict team outcomes (Weldon & Weingart, 1993). In order to combine efforts effectively, team members have to understand what they are trying to achieve. Much research also indicates that involvement in goal setting fosters commitment to these goals (Weldon & Weingart, 1993). In the context of team innovation, clarity of team objectives is likely to facilitate innovation by enabling focused development of new ideas, which can be assessed with greater precision than if team objectives are unclear (West & Anderson, 1996). Pinto and Prescott (1987), in a study of 418 project teams, found that a clearly stated mission was the only factor that predicted success at all stages of the innovation process. Therefore, in order for the team to be effective and innovative, this research asserts that team members must be clear about their collective aims. They must be agreed on task objectives and committed to fulfilling them and so it follows that the following hypothesis will be tested:

Hypothesis 2a: Team objectives will predict effectiveness and innovation

Second, many scholars agree on the significance of reflexivity for team effectiveness as they believe it can keep teams focused and efficient as well as improving both the subjective as well as objective measures of team performance (Tjosvold et al, 2004; Schnippers, 2008). Tjosvold et al. (2004) found that task reflexivity was a significant factor for leaders' ratings of innovation, indicating its significance in creating innovative teams. Carter and West (1998) found reflexivity to be beneficial: in their study of 19 BBC

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production teams they found that reflexivity predicted team effectiveness and in a field study of 59 work teams they found that team reflexivity mediated the relationship between diversity and team performance, commitment, and satisfaction. This research accordingly proposes that teams that take time out to review their objectives, strategies, team processes and ways of working prove more effective and innovative than those that do not. Thus, the following hypothesis will be posited in relation to this process:

Hypothesis 2b: Reflexivity will predict effectiveness and innovation

Third, the importance of the participation process, such as participation in decision making and regular meetings is exemplified by Hackman and Morris (1975). They contend that through the on-going interaction process which takes place among team members while they are working on a task, the group effectiveness problem can be understood. Lawler and Hackman (1969) also found that participation can improve the quality of decisions that are made and tends to foster greater effectiveness and commitment. Accordingly, this research considers that all team members should be encouraged to contribute to the decision making process and to meet frequently to ensure appropriate levels of interaction between themselves in order to be more effective and innovative. As a consequence, the following hypothesis will be advocated in relation to this process:

Hypothesis 2c: Team participation will predict effectiveness and innovation

Fourth, task focus is also considered as an influential factor for successful team processes. For example, West et al. (2004) found that if teams

were strongly focused on a task, then levels of demographic diversity seemed to promote innovation, while highly demographically diverse groups had low levels of innovation. In addition, Castka, Baber, Sharp and Belohoubek (2001) found that team performance improved when team members were focused on task goals and reduced when teams had no focus. Similarly, Forrester and Tashchian (2006) found the same result when studying student work teams: task focus and cohesion led to higher team effort and effectiveness. This research will propose that when team members regularly engage in constructive and mutually respectful debate about procedure, constructively discussing errors that routinely occur, they can learn and make improvements. In relation to this process the additional hypothesis will thus be tested:

Hypothesis 2d: Task focus will predict effectiveness and innovation.

Fifth, team conflict, is also one of the factors that influences team effectiveness. Conflict is separated into two types; relationship conflict (interpersonal incompatibilities, tension, animosity, and annoyance) and task conflict (disagreement among group members about task content). Due to these different types of conflict, teams should have the ability to respond to conflict effectively. Jehn (1997) surveyed 79 work groups and 26 management teams in a large freight transportation company: For groups performing routine tasks, task conflict proved to be detrimental to group processes. Task conflict appeared to promote critical evaluation of problems and options, while simultaneously reducing thoughtless agreement. Relationship conflict, however, was found to be detrimental to satisfaction and to members' intent to remain in the group regardless of the type of task, but it had no impact on performance.

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Dreu and Van Vianen (2001) extended the meaning of team conflict: using 27 teams interacting face-to-face once a week (team size ranged from 4 to 13) in a variety of organizations. They studied three types of conflict responses: a) collaborating responses, b) contending responses, and c) avoiding responses in regard to conflicts related to interpersonal issues, political norms and values, and personal taste. Results show that collaborating and contending responses to relationship conflict are negatively related to team functioning and effectiveness, while avoiding responses to relationship conflict are positively related to team functioning and effectiveness.

Passos and Caetano (2005) narrowed the conflict definition to intra-group conflict. They examined the effects of intra-group conflict, past performance feedback and perceptions of team decision-making effectiveness on team performance, using a sample of 183 individuals working in 47 different teams. The results showed a full mediation effect of perceptions of team decision in the relationship between process conflict and team performance. Task and relationship conflict showed no significant relationships with team performance and satisfaction with the team, whereas past performance feedback positively influenced team performance. The studies discussed above show that process could create some level of conflict between team members and that this conflict (in its wide or narrow definition) could have an impact on team effectiveness. Hence, this research proposes that task-related conflict and interpersonal conflict might have either a positive or negative effect upon team effectiveness and innovation and so, in relation to this process, the following is posited:

Hypothesis 2e: team conflict will predict effectiveness and innovation.

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Finally, creativity and innovation has also been proposed as an important dimension of effectiveness (West 1990). It has been argued that there is a premium on having teams that are willing to try different things, explore new work processes, and otherwise look to improve the manner in which work is accomplished (Gilson & Shalley, 2004). Creative processes have been described as being important because they can enhance the potential for creative and innovative outcomes, and possibly result in increased overall performance (Kanter, 1988). According to Torrance (1988), creative processes focus on identifying problems, discussing ideas with others, and contradicting what is normally expected. As such, creativity and innovation is hereby defined as the exchange of members' ideas and views and mutual support of ideas for new products, services and modes of working. To conclude and based on the preceding conceptual arguments, the following hypothesis will be tested:

Hypothesis 2f: creativity and innovation will predict effectiveness and innovation

## 4.2.3 The Relationship between Leadership and Team Processes

Team performance is determined by a wide range of factors such as skills, knowledge team processes, and resources available to the team (Hackman, 1990; West, 2002). Often work teams are allowed to self-manage their team processes, that is, the team has the authority and responsibility to manage how their team functions. The behaviour of the team leader has the potential to influence all of the factors that contribute to team performance (Tannenbaum, Salas & Cannon-Bowers, 1996). Leadership in teams is an area that merits more attention because leaders have potential impacts on team

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functioning (Solansky, 2008). Moreover, the leadership process affects the attitudes, beliefs, and behaviour of the team members (Ensley, Pearson, & Pearce, 2003). Accordingly, this research proposes that leadership potentially has influence on the team processes variables mentioned in figure 1.

Researchers have focused on investigating the factors that influence the effectiveness of work teams, from the shop floor through to top management teams (Cohen & Bailey, 1997). Little is known about how leaders manage effective teams and promote effective team processes (Cohen & Bailey, 1997; Zaccaro et al., 2001) and how leaders create and maintain favourable performance conditions for the team (Hackman, 2002).The behaviour of the team leader has the potential to influence factors that contribute to team innovation such as clarifying objectives and encouraging participation and support for innovation (Tannenbaum, Salas, & Cannon-Bowers, 1996). West et al. (2003) examined the relationship between leadership clarity, team processes, and innovation in 98 primary healthcare teams. They focused on the role of clarity displayed by team leaders in developing team processes that facilitate innovation. Results showed that leadership clarity is associated with clear team objectives, high levels of participation, commitment to excellence, and support for innovation.

Leaders who ensure clarity of team objectives are likely to facilitate innovation by enabling focused development of new ideas, which can be filtered with greater precision than if team objectives are unclear. Research evidence from studies of the top management teams of hospitals (West & Anderson, 1996) provides support for the proposition that clarity of team objectives is

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associated with high levels of team innovation. Furthermore, there are obvious reasons for supposing that when team leaders encourage participation, there will be relatively high levels of team innovation.

Team member participation in problem solving has been found to significantly enhance group effectiveness by increasing members' sense of responsibility (Bonito & Hollingshead, 1997). In addition, member participation also may positively affect the quality of decisions by increasing the input of decision relevant information and by having decisions made at a level closer to the problems at hand (Campion et al., 1993). Sharing decision making information, levels of influence and having good interaction within teams, can spawn creativity and innovation (Cowan, 1986; Porac & Howard, 1990). Flood et al., (2000) and Kuo (2004) found that transformational and laissez faire leaders are more likely to adopt consensus decision making which is known to improve team effectiveness.

Schnippers (2008) also highlights the importance of the team leader in influencing team processes such as reflexivity: the team leader can influence reflexivity directly by encouraging the team to reflect on their objectives, strategies, and processes and stimulating their communication (Widmer et al., 2009). Several studies have supported the idea of an impact of leadership behaviour on reflexivity: in a study of 50 research and development teams, Hirst, Mann, Bain, Pirola-Merlo, and Richter (2004) showed that facilitative leader behaviour, including a positive relationship with team members and open expression of ideas and opinions, was positively associated with team reflexivity.

Looking at team conflict from the leadership point of view, Schermerhorn, Jr., Hunt, and Osborn, (2002) feel that team leaders and managers must be comfortable in dealing with interpersonal conflict and be able to recognize situations in which conflict may develop and find the best solutions in order to facilitate conflict management. In terms of task-related conflict, effective managers should be able to change a potential destructive conflict into a constructive one which would result in positive benefits to individuals, the group or the organization by utilizing the event as an opportunity for creativity, for sharing more ideas and for improving team performance and satisfaction. Interpersonal conflicts need to be handled differently: managers must be alert to them and take quick action to eliminate or minimize their disadvantages which include decreases in productivity and job satisfaction. Teams with less relationship conflict often perform well because the leader has personalized individual commitment to the team's objectives (House & Shamir, 1993).

Leaders should also be highly task-focused in order to get the job done. Morgensen et al. (2005) look at task focus from the viewpoint of individual team members, highlighting conscientious individuals as those who are likely to avoid social loafing and free riding in teams and who are likely to be highly task focused. Leaders should nurture team members' self-discipline and dependability which also works to build a team climate that fosters personal accountability and norms counter to social loafing and free-riding.

When looking at team creativity and innovation, one must consider the impact of the leader in the creativity and innovation process. The importance of creativity and innovation, in the management literature, can be traced back to

Burns and Stalder (1961), who argued for change as a means to deal with uncertainty and team creativity was defined as divergent thinking in groups (Brown, Tumeo, Larey, & Paulus, 1998). Improving the creativity of teams is important if organizations are to compete successfully in today's globally competitive environment (Thacker, 1997). Team members can generate creativity that may not exist in a single individual. Therefore, the important component of providing a work atmosphere in which teams can feel motivated to be creative is the communication style of the leader: if team members do not perceive that the team leader is trying to be supportive of creativity, the creative processes of the group may be ineffective (Thacker, 1997).

In addition, an organization which has a climate supportive of innovation may also be important to team innovation. Support for innovation is defined as "the expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment" (West, 1990). Kozlowski and Hults (1987) found that climate such as supervisor support and innovation, is considered as a predictor of factors related to individual innovative behaviour. In conclusion, based on the preceding conceptual arguments, this research expects that there is a relationship between leadership and team processes. These processes can be said to include objective, reflexivity, participation, task focus, team conflict, creativity and innovation). These additional hypotheses must therefore be posited:

Hypothesis 3a: Leadership will predict objectives.

Hypothesis 3b: Leadership will predict reflexivity.

Hypothesis 3c: Leadership will predict participation.

Hypothesis 3d: Leadership will predict task focus.

Hypothesis 3e: Leadership will predict team conflict.

Hypothesis 3f: Leadership will predict creativity and innovation.

### 4.2.4 The Relationship between Leadership and Outputs

Leadership is considered to be one of the factors that affect team effectiveness and innovation. In the face of an increasing demand for innovation, organizations have begun to view leadership holistically as concertive action (Gronn, 2002) and to shift some traditional leadership roles onto other team members. Ahearn et al. (2004) state that leaders were once seen as overseers but now their role is much more that of a coach or facilitator providing coordination of efforts, elimination of barriers and orchestration of worker skills, talents, and motivation. Similarly, researchers have also begun to acknowledge the importance of leadership, wherever it occurs (Hunt & Dodge, 2000). Kuo's (2004) study of the impacts of team leadership on team effectiveness found that transformational leadership has a positive and significant impact on team effectiveness. In terms of the latter, team leaders exhibit different patterns of behaviour. These include establishing the team's structure and purposes, ensuring the team has all the resources it needs and that any obstacles are removed (Hackman & Wageman 2005). In addition, one can also consider the influence of shared leadership in which the team leader and team members share the responsibilities for the task. If teams adopt this approach, they are likely to have high team effectiveness and operate as high performance teams (Pearce & Sims, 2002). Mehra, Smith, Dixon and Robertson (2006) focus on this type of leadership and their results found varied

levels of influence on team effectiveness depending on leadership structure and team composition.

Yukl and Van Fleet (1990) mentioned that leader activities cluster around two basic orientations: attention to task accomplishment, or attention to people. Hackman, (2002) also mentioned that the team leader has three overall tasks to perform: to build and maintain the team as a performing unit; to create the conditions that enable the team to do its job; and to coach and support the team to success. Moreover, this research also considered different aspects of leadership. These can be divided into 3 overall categories: leading, coaching and managing. The following will discuss these aspects:

First, leading involves the team leader setting clear long-term team objectives; ensuring the team has all the resources and organizational support required, and supporting team member ideas for innovation (West et al., 1998). The importance of sharing common goals and perceptions amongst leaders and teams is highlighted by Gibson, Cooper and Conger (2009) who focus on leader–team perceptual distance. This is when there are differences in the perceptions of leaders and teams. They found that differences in perception can create precarious situations, especially for goal accomplishment and constructive conflict and that performance was found to be higher for these factors when perceptual distance was low (Gibson, Cooper & Conger, 2009). Team members should also be supported by their leaders by being given appropriate resources in terms of training, technical expertise, money, materials, guidance for improving effectiveness (Hackman, 2002). Leaders should be clear in the team processes they develop as this is associated with clear team

objectives, high levels of participation, commitment to excellence, and support for innovation (West et al., 2003).

Second, team leaders also have the role of managing their teams by clarifying clear objectives and roles and monitoring performance (West et al., 1998). Indeed, Cohen & Bailey, (1997), in their research on self-managed cross-functional project teams, found that teams are less likely to be successful if they do not have a leader. However, there is evidence that leadership is not related to levels of team innovation. For example, Eisenbeiss, van Knippenberg and Boerner (2008) carried out a study of 33 research and development teams and confirmed that transformational leadership is instrumental in team innovation but that it is not in itself sufficient to stimulate team innovation: team innovation is only enhanced when the climate for excellence is high, in other words when team members share a concern for high-quality performance. Meanwhile, Mehra, Smith, Dixon and Robinson (2006) investigated how distributed leadership in teams influences team performance, in a sample of 28 field-based sales teams. Their findings revealed that distributed leadership networks are not necessarily associated with higher team performance. However, leadership networks that show a distributed or decentralization–coordinated structure are associated with higher team performance than traditional leader-centered leadership networks and distributed-fragmented leadership networks. Leaders must ensure that organizational and team objectives work together and that these objectives are clearly presented to the team and organization. In fact, in a study of 26 teams, Antoni (2005) found that management by objective systems can be an effective tool in improving group effectiveness.

Finally, the leaders' coaching role should be considered. The leader acts as a trainer and observer, providing constructive feedback, as well as ensuring timely, meaningful rewards for desired team behavior and combined performance (Antonioni, 1994). In addition, team coaching is exhibited when leaders help manage day to day interactions and processes within the team (West et al., 1998). It can be also defined as direct interaction with a team to help them coordinate their collective resources and ensure they are task-appropriate. (Hackman & Wageman, 2005). Leaders should be available to discuss problems and stressful situations, to help solve them by encouraging teams to use their collective resources and to look at them from different perspectives, as well as to learn from their mistakes (Fuqua & Newman, 2004; Hackman & Wageman, 2005). To conclude, on the basis of the preceding conceptual arguments, this research attempts to explore the issue of how team leadership (whether leading, managing or coaching) impacts effectiveness and innovation. In so doing it will test the following hypotheses:

Hypothesis 4a: Leadership will predict team effectiveness.

Hypothesis 4b: Leadership will predict team innovation

## 4.2.5 The Relationship between Team Inputs and Outputs

Among the major input variables for team effectiveness are aspects of the team design, such as task structure and group composition, and aspects of the organizational context of teams, such as rewards and incentives, training, information systems, organizational support and resources (Cohen & Bailey, 1997; Gladstein, 1984; Hackman, 1987; Tannenbaum, Beard, & Salas, 1992; West, Borril, & Unsworth, 1998).

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Research on the determinants of group performance has been reviewed by Hackman and Morris (1975). They conclude that team effectiveness is dependent on the level of effort exerted by the team members and the amount of knowledge and skills they can apply to the task (Hackman, Brousseau & Weiss, 1976). In addition, Salas et al. (1992) argued that the resources allocated to the team also influence effectiveness, and Hackman, Wageman, Ruddy, and Ray (2000) found that ensuring that a team has a high level of task interdependence is critical to its effectiveness.

One of the most influential models of task design, proposed by Hackman and colleagues (Hackman, 1990; Hackman & Lawler, 1971; Hackman & Oldham, 1975) identifies five characteristics of motivating task: autonomy, task variety, task significance, task identity and relevant task feedback. These characteristics are related to team effectiveness. Campion and colleagues (1996) studied employee and managerial work groups in a financial services organization. Results revealed that task design characteristics were relatively strong predictors of effectiveness. Hackman's task design characteristics have also predicted facets of team effectiveness for both self-managing and traditional teams. Cohen, Ledford and Spreitzer (1994) examined the differential patterns of predictors of effectiveness for each team type. The task design characteristics, however, only predicted self-rated productivity for self-managing teams, and absenteeism and self-rated quality of work life for traditional teams. Likewise, Cohen and Bailey (1997), in their review of team research, presented a framework that incorporated task design features, attitudes toward team activities, and team characteristics as drivers of group processes, and ultimately

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team effectiveness. Task design in this research measures whether the team has a complete and challenging task to perform and the extent to which the team has autonomy to decide how best to perform its work. It also looks at the task relevance for the organization's success, considers whether the team receives feedback on how well it is performing and the extent to which the team members have to work interdependently to get the job done.

In addition, obtaining the appropriate level of team effort and the correct team skills are essential aspects influencing team effectiveness (West et al., 2004).There is considerable agreement that heterogeneity of skills in teams performing complex tasks is good for effectiveness (Campion et al., 1994; Guzzo & Dickson, 1996). To highlight the significance of team effort and skills, in Bell's (2007) analysis of 89 different sources, the relationships between team composition variables including personality and skills, indicated that factors such as team conscientiousness, agreeableness and collectivism influenced team performance (Bell, 2007). Thus, the effectiveness of team effort and skills is influenced by team member motivation, appropriateness of team member skills, diversity and team potency. Accordingly, this research measures team effort and skills in terms of the extent to which the team has the right mix of skills it needs to perform its task successfully; the motivation of its members to get the job done; and the extent to which they believe that their team can achieve its goals.

Providing organizational support for teamwork has been found to be important in enhancing team effectiveness (Kennedy et al., 2009; Hackman, 1990; Sundstrom, Meuse & Futrell, 1990; Gladstein, 1984). Work teams are

embedded within an organizational context; therefore the structure and support from the organization affect how teams perform and whether they achieve their goals (Guzzo & Dickson, 1996; Tata & Prasad, 2004). Moreover, Guzzo et al. (1993) argue that if team members perceive that there are sufficient resources within the team and that it has the necessary external support, then members are likely to believe it can effectively achieve its goals. Organizations can support teams in different ways: the first is by making sure that teams have necessary resources, such as access to information, equipment, facilities, and time to meet (Stocks & Harrell, 1995). The organization should also be enthusiastic about working with teams, encourage team members to develop their teamwork skills and provides them with the resources with which to complete their task. Another key aspect of organizational support to teams is training. Adequate training in areas such as group decision making, and interpersonal skills, as well as in technical knowledge positively impacts team effectiveness (Campion et al, 1993; Cannon-Bowers et al., 1995; West et al 2005). Accordingly, this research also assesses to what extent the organization provides team members with training to enable them to work effectively in teams.

The level of team innovation is also likely to be determined by the resources available to teams. Previous writers have suggested that resources available in organizations will, to a significant extent, determine the level of innovation, (Rogers, 1983; Rogers & Agarwala-Rogers, 1976). However, there is evidence that suggests that resources available to teams do not predict overall team innovation: in a review of the United Nations studies of research

team effectiveness, Payne (1990) concluded that there was no evidence from these studies that more resources and better facilities led to better scientific performance. Based on the preceding conceptual arguments, this research hypothesizes, that, for teams to be effective and innovative, task design, team effort and skills, organizational support and resources are required. Specifically,

H5a: Task design will predict effectiveness and innovation

H5b: Team effort and skills will predict effectiveness and innovation

H5c: Organizational support will predict effectiveness and innovation

H5d: Resources will predict effectiveness and innovation

Despite the fact that many team studies are based on input–process–output models, relatively few studies test mediation assumptions explicitly (Stewart & Barrick, 2000): Hertel et al. (2004) show that effects of task, goal, and outcome interdependence on the effectiveness of virtual teams were partly mediated by team members' motivation. Meanwhile Stewart and Barrick, 2000 demonstrated that both social processes (i.e., team openness-to communication and conflict) and task-related processes mediated the curvilinear relation between task interdependence and team performance.

Among the relatively few studies that tested the complete mediation process is the study of Bass, Avolio, Jung, and Berson (2003), which showed that group potency and cohesiveness can partially mediate effects of transactional and transformational leadership. In a similar way, Sy, Cote, and Saavedra (2005) reported that the relation between leader mood and group coordination is mediated by positive and negative group affective tone. Finally,

Antoni (2005) reported that team climate for innovation mediates effects of team task structure on team innovation.

Leadership processes have a considerable influence in determining whether team inputs, such as team task, team member characteristics, organizational context, are translated into group processes that produce team outputs (Borrill & West, 2005). A leader can do much to promote team effectiveness by helping team members learn how to work interdependently, building commitment to the group and its task, and helping them develop creative new ways of proceeding with the work (Hackman et al., 2000). In other words, leadership may be most valuable when combined with high levels of team inputs. As a matter of fact, both the variables of leadership and team members' characteristics can influence or impact team effectiveness (Early & Mosakowski, 2000). The following hypotheses were consequently designed to test the predicted relationships between team inputs and team outputs in terms of effectiveness and innovation mediated by team processes and leadership:

> H5e: Processes will mediate the inputs, effectiveness and innovation relationships
>
> H5f: Leadership will mediate the inputs, effectiveness and innovation relationships

## 4.3 Conclusion

Through a review of relationships between different input, processes and outputs factors, this chapter presents the hypotheses proposed in order to answer the main question of this research "which factors predict the effectiveness of healthcare teams?". These hypotheses will be tested in the

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context of Jordanian healthcare teams. The findings of these hypotheses will show the relationships between team inputs and processes; team processes and outputs in terms of effectiveness and innovation; leadership and processes; leadership and outputs in terms of effectiveness and innovation; and the relationships between team inputs and outputs mediated by team processes and leadership. By an empirical examination this research will also describe the extent to which these inputs factors along with team processes and leadership predict team outputs in terms of team effectiveness and innovation.

# CHAPTER 5

## MEASURING TEAM FUNCTIONING AND EFFECTIVENESS

### 5.1 Chapter Overview

This chapter seeks to review the measures of team effectiveness and team functioning to assess which method and measure should be adopted for this research.

### 5.2 Measuring Team Functioning and Effectiveness

Researchers studied team effectiveness from different approaches such as social psychology (McGrath, 1984; Steiner, 1972), socio-technical theory (Cummings, 1978), industrial engineering and organizational psychology (Gladstein, 1984; Guzzo & Shea, 1992; Hackman 1987; Sundstrom, De Meuse, & Futrell, 1990), and presented models to measure team effectiveness in organizations. The most important models were presented by Gladstein (1984), Guzzo and Shea (1992), Hackman (1987), and Tannenbaum, Beard, and Salas (1992); Stevens and Campion (1999). These models measured team effectiveness from a perspective adopted by each of these researchers. The models could be classified according to two main approaches measuring team effectiveness: the IPO and Meta Framework categories highlighting different factors as being significant for measuring team effectiveness. Different measures for assessing team functioning also consider different factors as significant (Salas et al., 2004). However, what has not yet been considered are the methods used to measure team functioning in order to predict team effectiveness: should they be through questionnaires or interviews or should

teams simply be observed? These are some of the questions that this section will therefore try to answer.

Early measures focused on behavioural observations, checklists, frequency counts and ratings scales designed to capture the degree to which team members are competent at tasks that are directly related to team performance (Dorsey et al., 2009; Krokos, Baker, Alonso and Day, 2009). One early measurement tool was established by Schiflett, Eisner, Price and Schemmer (1985) and was based on one of the first models of team effectiveness developed by Nieva et al. (1978). The dimensions highlighted in this model included orientation, resource distribution, timing, response coordination and motivation and all possessed detailed observable behaviour. The reliability and validity was shown to be acceptable and ratings were measured by observing colour videos of mortar field exercises and assault ribbon bridge exercises.

In 1986 Morgan Glickman, Woodard, Blaiwes and Salas developed the Critical Team Behaviours Form (CTBF) which included seven skill dimensions which were assessed through observation by checklists. An examination of three tactical-decision making teams during training found that the dimensions of coordination, communication, and adaptability differentiated between teams performing well and poorly. It was shown to be reliable and in 1987 Glickman, Zimmer, Montero, Guerette, Campball, Morgan and Salas further tested the measure further on 13 decision-making teams. The results showed that high performing teams fared better in the CTBF than low performing teams (Baker and Salas, 1992).

More recently researchers have been using simulations to create scenarios for teams to work in: Zheng, Denk, Martinec, Gatta, Whiteford and Swanstrom (2008) developed the Legacy Inanimate System for Laparoscopic Team Training (LISETT) to help surgical teams develop their team skills using simulation and therefore without risking patient safety. The LISETT was tested on 44 surgical teams to analyze the influence of individual skill and team dynamic. The findings proved LISETT to be a valid system for measuring team work skills during surgery.

However, due to their heavy reliance on human observation, these types of measurements pose several problems regarding unreliability and accuracy. Observers must capture processes, performance decisions and actions simultaneously and in often complex situations. These environments also often have limited space, such as a surgical theatre, therefore using multiple raters is difficult. Although using multiple raters is more reliable, it is also problematic since rater training is required to ensure that all raters use the same standards during observations. Finally, there is the possibility of the Hawthorne effect, which is when there are changes in team performance resulting from the observation process (Dorsey et al., 2009; Krokos et al. 2009).

As a result of these problems, more recent measures have adopted 'multimethod' approaches, using detailed questionnaires based on complete IPO measures as well as on site observer ratings (Krokos et al., 2009). For example Marks, DeChurch, Mathieu, Panzer, & Alonso, (2005) recruited 184 students from psychology courses at a southeastern university to participate in a study on multi team systems. Team member interviews were recorded and

rated using behavioural anchors for different processes. They observed how the team members worked together and finally ranked the extent to which the teams met their goals. The measure was found to be reliable using Cronbach Alpha. However, even this approach requires a high level of observation and therefore is not feasible when time constraints and large study samples are present.

Therefore, several researchers have come to adopt questionnaires in their approach to measuring team effectiveness. Questionnaires are beneficial as they generate a substantial amount of data relatively cheaply while maintaining participant anonymity. In addition, the structured questions facilitate data analysis well (Dunderdale, 2000)

As with team effectiveness models, measures of team functioning tend to focus on different factors. For example, Kaplan (1989) reviewed 180 measures of team function and only found three to be valid and reliable. These were Friedlander's (1968) Group Behaviour Inventory which focused on team member attitudes and interactions during meetings; Wilson Learning's (1986) Team Interaction Profile, which focused on teams in general and Honeywells' (1985) Job Reaction Questionnaire which focused on the task more than anything else and was the only measure to include feedback. Through this review Kaplan argued that it would be better if a more comprehensive measure was used combining the factors of the three measures and more. From this point, many scholars worked on developing such measures:

One of the most well-known measures for measuring team innovation is Anderson and West's team climate inventory (TCI) which was developed during the 1990s (1996, 1998). After several studies to test the reliability and validity,

the inventory came to adopt five factors: participative safety, support for innovation, vision and task orientation, and social desirability. Each of these factors included several sub-factors, for example: participative safety consisted of information sharing, safety and influence. All factors and sub-factors revealed acceptable reliability. Tseng, Liu and West (2009) utilised the TCI using data from 203 administrators employed in Taiwan and found it to be a feasible measure outside the UK and essential for measuring team climate. While shown to be useful, however, this measure only focuses on team climate, therefore it is not a comprehensive measure of team functioning.

Bateman, Wilson and Bingham (2002) developed a more comprehensive measure of team functioning for healthcare teams which focuses on six domains considered to be important to team effectiveness: team synergy, performance objectives, and skills, use of resources, innovation and quality. Following a pilot study of 400 participants across 37 teams, reliability and validity tests were conducted and found to be good. It is reported that the audit tool has been well received and has been shown to be an effective mechanism of linking individual and team performance with organizational-management objectives. However, it does not emphasize the significance of feedback and recognition which is considered to be an important factor for predicting team effectiveness (Singh et al., 2007).

Gibson, Zellmer-Bruhn and Schwab (2003) developed a generalized team effectiveness measure which aimed to be used across cultures and multiple, multinational organizations. They assessed teams in four different countries of a multinational organization. The research dimensions were gained

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through structured interviews in all four countries and as a result five outcome dimensions were delineated: goals (did the team meet its objectives?), customers (did they meet their customers' needs?), timeliness (did they work efficiently in terms of temporal goals?), quality (was their work error-free?) and productivity (how efficient was the team with respect to the ratio of inputs to outputs?) and worked to combine and expand several approaches to measuring team functioning. These include task design, leadership, motivation and learning. While the researchers found the measure to be effective for their research and the reliability and validity was shown to be acceptable, the fact that it is limited to outcomes, and that the questionnaire only possesses 26 items, makes it rather a narrow research tool.

This review of approaches to measuring team functioning indicates how varied measures and methods can be. Based on the review of methods for measuring team functioning, attributes for both observational ratings and questionnaires have been highlighted. Although questionnaires do not allow for any interpretation of non-verbal data, due to the desire for a large sample size, it has been decided to adopt the questionnaire approach (Dunderdale, 2000). However, the review of questionnaire based measures indicated the weakness of these widely used measures due to their lack of comprehension of all factors that can influence team functioning and in turn, predict team effectiveness.

Despite the fact that the IPO model is a highly effective way of measuring team effectiveness, there is no fully comprehensive model which includes all predictors and different theoretical approaches to measuring team effectiveness. The decision has therefore been made to use the Aston Team

Performance Inventory survey instrument developed by West, Markiewicz and Dawson (2005). This has been adopted for this research as it relatively comprehensively assesses the main dimensions of team working and team effectiveness based on the IPO model. The ATPI also describes how team inputs and processes can be linked to team effectiveness and examines the factors that influence team effectiveness by assessing the main input factors that influence team performance, assessing team and leadership processes and evaluating the team's performance as a whole. Thus it can be used to support teams by identifying which factors they need to improve to become more effective.

However, one of the weaknesses of the ATPI is that this instrument is self-reporting and measures the effectiveness from team members' points of view. Self-ratings have been found to have lower validity than leaders' ratings as individuals tend to judge their behaviour to be of a higher standard than that of others and therefore leaders' ratings tend to be more subjective (Griffin, Neal and Parker, 2007; Jaramillo et al. 2005). Therefore, this research will adopt the Leader Ratings Measure, adapted from work by West, Borrill et al, (2000), as an independent measure to determine team effectiveness from the leaders' point of view in the Jordanian settings. Considering leaders' ratings is significant as due to their position, a team leader has greater access to information about the relative performance of the entire work team compared to a team member (Jaramillo, Carrillat and Locander, 2005).

## 5.3 Research Measures

This research adopts two measures to assess team functioning and effectiveness: the first measure is the ATPI which was developed to measure the functioning from team members' points of view based on the IPO model. This measure will be used primarily for establishing the psychometric properties using data from healthcare teams in UK before applying it to the Jordanian settings. For the purpose of this research team inputs, processes and leadership will be measured using the ATPI. The second measure is the leader ratings which will be used to measure team outputs from the team leaders' point of view in the Jordanian healthcare teams. The following section will describe the two measures adopted for this research.

## 5.3.1 ATPI Measure

The ATPI measure is based on open system theory and was developed by authors who have worked with a wide variety of organizations nationally and internationally over the past 20 years, in the public and private sectors to develop team and team-based working. They have in-depth experience of developing team-based working in a variety of healthcare organizations ranging from acute hospitals to primary healthcare organizations, mental health teams, and integrated social services and health teams and have carried out extensive research into different models and measures which led to the creation of the ATPI.

The ATPI measure gives an assessment of a team's performance by assessing the key elements of team working and provides information that enables team members to initiate changes that will lead to improved team

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performance. The measure describes how team inputs and processes can be linked to team effectiveness and examines the factors that influence team effectiveness in three distinct areas: (1) assessing the main input factors that influence team performance, (2) assessing team and leadership processes and (3) evaluating the team's performance as a whole. Thus it can be used to support teams by identifying which factors they need to improve to become more effective. The following figure illustrates this measure:

FIGURE 2

**Input-Process-Output Model of Team Effectiveness**
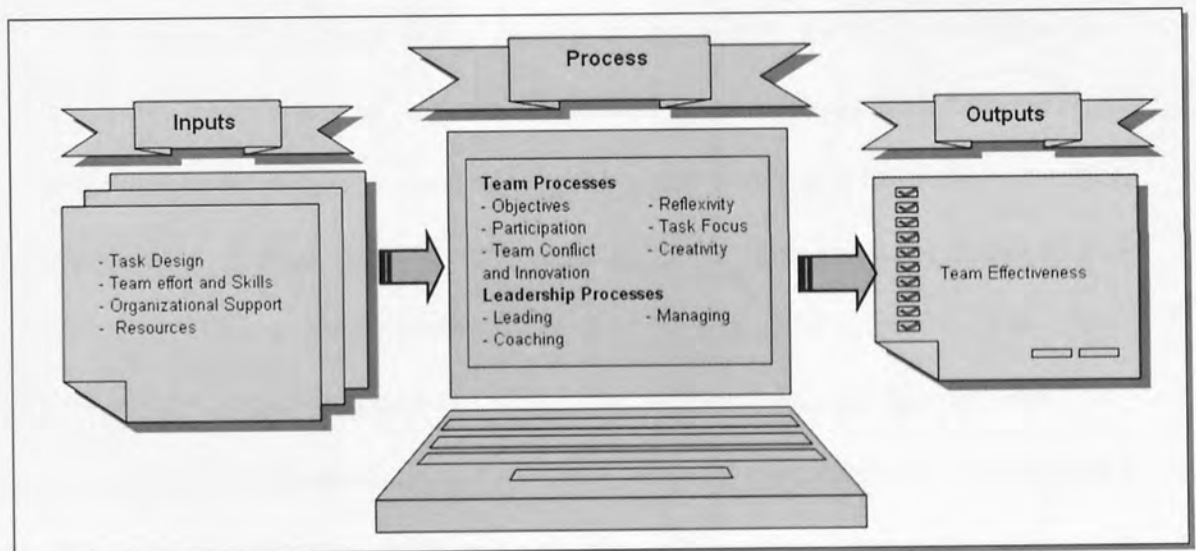


Source: Summary of West et al. (2005) ATPI Model

Each of the dimensions that make up the ATPI measure is an important component of effective team and team-based working and includes all of the input and process variables mentioned in Chapter Three, grouped into different categories, as well as output variables. The team inputs are comprised of four different dimensions:

1. **Task design** measures whether the team has a complete and challenging task to perform and the extent to which the team has the autonomy to decide how best to perform its work (such as deciding who will do what and how the work will be carried out). It also looks at the task relevance for the organization's success, considers whether the team receives feedback on how well it is performing and the extent to which the team members have to work interdependently to accomplish the job. Examples of items in this variable are: "We decide as a team who will do what in the team," and "We usually know how well we are achieving the team goals."

2. **Team Effort and Skills** measures the extent to which the team has the right mix of knowledge and skills it needs to perform its task successfully; whether its members are motivated to get the job done; and the extent to which they believe that their team can achieve its goals. Examples of items in this variable are: "Every team member puts in sufficient effort to get the job done," and "Our team members have the right skills needed to do the team's work."

3. **Organizational Support** indicates to the organization to what extent it provides team members with support through training, communication and creating a good climate to enable them to work effectively in teams. Examples of items in this variable are: "This organization strongly believes in the importance of training for team working," and "Communication of information to the team by the organization is excellent."

4. **Resources** assesses whether the team has the right number of people, the material, financial and technical resources it needs to do the job. Examples of items in this variable are: "The team is given the resources it needs

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to do the work," and "The team is given the financial, technical and material resources it needs to achieve its objectives."

The team processes are made up of two sub-elements: team and leadership processes. The team processes comprise of six dimensions:

**1. Objectives:** Team members must be clear about what the team aims to achieve. They must agree about its objectives and be committed to fulfil these objectives. Examples of items in this variable are: "We agree in the team about what are our team objectives," and "Team members are committed to achieving the team's objectives."

**2. Reflexivity:** Teams that take time out to review their objective, strategies, team processes and ways of working are both more effective and innovative than those that do not. Examples of items in this variable are: "We regularly discuss whether the team is working effectively together," and "The team often reviews its objectives."

**3. Participation:** All team members should be encouraged to contribute to the decision-making process and to meet frequently to ensure appropriate levels of interaction between team members. The following are examples of items in this variable: "Everyone in the team contributes to decision making," and "We all influence the final decisions made in the team."

**4. Task Focus:** When team members regularly engage in constructive and mutually respectful debate about how best to do the work, constructively discussing errors and mistakes that occur during the course of everyday work, they can learn from them and make improvements. "We are committed to doing

an excellent job in this team," and "We have lively debates about how best to do the work." would constitute examples of items in this variable.

**5. Team Conflict:** Task-related conflict and interpersonal conflict might impact team effectiveness positively or negatively. Examples of items in this variable might be: "There is little interpersonal conflict in this team," and "There is often conflict over how best the team can achieve its objectives."

**6. Creativity and innovation:** Members will exchange ideas and views and support each other's ideas for new products, services and ways of working. The following are examples of items in this scale are: "We support each other's ideas for new and improved ways of doing the team's work," and "In this team we seek out and support ideas for new products/services."

The leadership processes are assessed in the three different dimensions of team leadership:

**1. Leading:** Refers to the extent to which the team leader sets a direction for the team's work and how clearly they describe its overall targets, ensuring the team has the necessary resources to do its work and also supporting ideas for new ways of working offered by team members. Consequently, examples of items in this scale are: "The leader of my team supports team members' ideas for new and improved ways of doing things," and "The leader of my team ensures we have all the resources we need to do the team's work effectively."

**2. Managing:** Helps the team to organize and coordinate its work, encourages the involvement of all team members in decision-making, and checks the team's progress against its objectives, praises good performance, gives feedback and encourages inter-team working. "The leader of my team helps the team

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organize and co-ordinate work activities to avoid delays," and "The leader of my team checks on the quality of the work carried out by the team." would be examples of items for this variable.

**3. Coaching:** Encourages and supports team members in times of difficulty, prompting them to learn from errors and look at problems in new ways. For this variable, examples include: "The leader of my team is available to team members to discuss a problem or particular issue," and "The leader of my team provides encouragement and support when the team has a difficult or stressful task."

Finally, team outputs are also included in the measure and they are divided into five dimensions:

**1. Team Member Satisfaction:** The ATPI assesses team member's satisfaction in relation to how they perceive the recognition they receive from other team members for their contribution to the team's work; the responsibility assigned to them; whether their team members support them; whether they impact team decisions; whether work-related problems are openly dealt with by team members and how conflicts are resolved within the team. Therefore examples of items in this regard would be: "I am satisfied with the support I receive from team colleagues," and "I am satisfied with the amount of responsibility I am given in the team."

**2. Attachment:** Effective and well-functioning teams usually meet the need to belong and team members feel a healthy attachment to their workplace. They have a strong desire to keep working with other team members and feel sad if they have to leave the team. It follows that examples for this variable are: "I

have a strong attachment to my colleagues in this team," and "I would like to keep working in this team."

**3. Team Effectiveness:** Team effectiveness is the most important of all the ATPI dimensions. Teams exist to perform tasks that cannot be performed so effectively by individuals working alone. The most important part of their functioning is to perform the team task effectively. Examples of items in this variable are: "Managers often praise the quality of our work," and "The team is often told by others that it is performing well."

**4. Inter-team Relationships:** The ATPI measures the extent to which there is a high level of cooperation with other teams and a low level of destructive conflict with other teams. "We work closely with other teams and departments in the organization," and "There is a high level of co-operation and trust between our team and other teams and departments in the organization." exemplify items for this variable.

**5. Team innovation:** measures to what extent the team is developing new and improved products and services or ways of working. Examples of items here might include: "We develop new and improved ways of working," and "We develop innovative ways of accomplishing targets and objectives."

However, the output variables mentioned above will not be used for the purposes of measuring the effectiveness of healthcare teams in the Jordanian settings due to the fact that they measure effectiveness from team members' point of view as mentioned earlier. Instead the leader ratings measure will be used for this purpose.

**5.3.2 Leader Ratings Measure**

In order to have more objective measures of team effectiveness the Leader Ratings (LR) measure, adapted from work by West, Borrill et al, (2000), will be used as an independent measure of team effectiveness from the team leaders' point of view. As mentioned before, using data from different perspectives is a valuable way of gaining a holistic view of team effectiveness. The LR measure consists of the following three variables:

**Team Effectiveness:** for managers the most important aspects of team effectiveness are that the team understands and values each member's role and responsibilities, effectively prepares and implements procedures with which to complete the task - including strategies for communication - and works effectively to the needs of the task and the clients. In addition, team members should be committed and develop personally and professionally. Examples of items here are: "Effectively provide patients with information on services available, how to contact a doctor or nurse during normal hours and in an emergency," and "Effectively implements procedures for dealing with patient comments, suggestions and complaints."

**Strategic Orientation:** Strategic Orientation is when a team adopts guidelines to create superior and continuous performance. Strategic Orientation includes customer orientation, where teams are concerned with the needs of their clients, and competitor orientation, where they gather information about their competitors and about the reactions of their competitors to their movements. For this variable, examples might include: "Effectively collaborates with other agencies, such as social services," and "Effectively makes optimum use of its budget."

**Innovation:** For leader ratings, innovation includes setting targets and methods for achieving them, initiating new products or information systems, developing innovative ways of reaching targets or goals and introducing changes to job content and work methods. For this variable, examples would include: "Deciding the methods used to achieve objectives," and "Developing innovative ways of accomplishing objectives."

## 5.4 Conclusion

The review of different approaches to measure team functioning and effectiveness indicates a lack of a comprehensive measure as many have a narrow focus on factors such as climate, or team functioning during meetings (Anderson et al., 1996, 1998; Kaplan, 1989). Therefore, this research has adopted the ATPI measure which includes the factors that influence team effectiveness in a detailed questionnaire. The decision to use a questionnaire, rather than observational ratings, was also made due to the desire for a large study sample. However, a limitation of the ATPI is that this instrument is a self-report which measures the effectiveness from team members' points of view, which may be considered somewhat inaccurate. Therefore, this research adopts the Leader Ratings (LR) measure, adapted from work by West, Borrill et al, (2000), as an independent measure to determine team effectiveness from the leaders' point of view in the Jordanian setting. The following chapter will focus on the methods that will be used to assess the psychometric properties of the ATPI measure in order to adopt it in the healthcare teams in the Jordanian hospitals.

# CHAPTER 6

## STUDY I:

## PSYCHOMETRIC PROPERTIES OF THE ASTON TEAM PERFORMANCE

## INVENTORY (ATPI)

### 6.1 Chapter Overview

This chapter focuses on the methods used to assess the psychometric properties of the Aston Team Performance Inventory (ATPI) survey instrument developed by West, Markiewicz and Dawson (2005). The survey instrument includes 18 dimensions of team working and team effectiveness. Secondary data was collected from 797 team members in 61 healthcare teams collected by the institute of Health Services Effectiveness at Aston Business School and was used for the purpose of this study. The reliability and validity analysis results indicate that the ATPI survey instrument has good psychometric properties.

### 6.2 Introduction

Teams are an important part of the functioning of an organization. They can be significant contributors to their effectiveness or can cause problems and restrict organizational success (Cacioppe and Stace, 2009). Thus, for those organizations that do implement teams we need reliable and valid ways of measuring the factors that influence team effectiveness. The aim of this study is to examine the psychometric properties of the ATPI survey instrument before applying it to the healthcare teams in the Jordanian setting. The instrument was developed by West et al (2005) and based on the inputs, processes and outputs model to assess the main dimensions of team working and team effectiveness.

The ATPI survey instrument includes 18 dimensions of work team effectiveness with 100 items in total. The dimensions are: 1.Task Design, (2) Team Effort and Skills, (3)Organizational Support, (4)Resources, (5)Objectives, (6)Reflexivity, (7)Participation, (8)Task Focus, (9)Team Conflict, (10)Creativity and Innovation, (11)Leading, (12)Managing, (13)Coaching, (14)Team Member Satisfaction, (15)Attachment, (16)Team Effectiveness, (17)Inter-Team Relationship, and (18) Team Innovation. Reliability of scales was demonstrated using Cronbach's coefficient alpha. Construct validity was demonstrated through exploratory factor analysis and confirmatory factor analysis.

## 6.3 Sample

The study sample was applied to (797) team members in (61) teams and the data for this sample was taken from different healthcare organizations and collected by the Institute of Health Services Effectiveness at Aston Business School between the years 2003-2006.

## 6.4 Measure

The study applies the ATPI instrument survey, which comprises one hundred items distributed across 18 dimensions to measure inputs, processes, and outputs (Appendix 1). The Likert 5-point response format was also used ranging from: 1= strongly disagree to 5= strongly agree for positive items and 5= strongly disagree to 1= strongly agree for negative items. This instrument consists of three sections as outlined below:

<u>Section 1:</u> This section contains ten items about the team in general. The items in this section aim to give a broad view of the type of teams (e.g. how many

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teams do you work in? What is your main team's overall task? For how long has the team been formed?).

**Section 2:** This section contained one hundred items distributed into four sections as follows:

2:1: **Team Inputs** contains four dimensions of team inputs (task design, team effort and skills, organizational support and resources) and 34 items reflecting the rating of overall team inputs (29 positive items and five negative items namely items 4, 14, 19, 28, and 33)

2:2: **Team Processes** contains six dimensions of team processes (objectives, reflexivity, participation, task focus, team conflict, creativity and innovation) and 28 items reflecting the rating of overall team processes (27 positive items and one negative item number 47).

2:3: **Leadership Processes** contains three dimensions of leadership processes (leading, managing, and coaching) and 17 positive items reflecting the rating of overall leadership processes.

2:4: **Team Outputs** contains five dimensions of team outputs (team member satisfaction, attachment, team effectiveness, inter-team relationships and team innovation) and consists of 21 positive items reflecting the rating of overall team outputs.

**Section 3:** This section includes six items about team biography and team characteristics (e.g. age, gender, job title, work experience). Table 1 illustrates the distribution of the instrument items.

TABLE 1

Distribution of ATPI Scale Items

| | ATPI Variables | | Dimensions | Items |
|---|---|---|---|---|
| Team Input | | • | Task Design | Q34, Q9, Q20, Q31, Q10, Q30, Q15, Q26, Q2, Q13, Q24. |
| | | • | Team Effort And Skills | Q1, Q12, Q23, Q5, Q16, Q27, Q21, Q32 |
| | | • | Organizational Support | Q18, Q29, Q8, Q19, Q11, Q22, Q33, Q3, Q14, Q25, Q4 |
| | | • | Resources | Q6, Q17, Q28, Q7. |
| Processes | Team Processes | • | Objectives | Q55, Q61, Q59. |
| | | • | Reflexivity | Q36, Q40, Q48, Q37 |
| | | • | Participation | Q46, Q54, Q56, Q60, Q38, Q42, Q50 |
| | | • | Task Focus | Q41, Q49, Q57, Q52, Q44, Q62 |
| | | • | Team Conflict | Q35, Q39, Q47, Q43, Q51 |
| | | • | Creativity And Innovation | Q45, Q53, Q58 |
| | Leadership Processes | • | Leading | Q73, Q63, Q68, Q76 |
| | | • | Managing | Q64, Q69, Q66, Q71, Q74, Q78, Q67, Q72 |
| | | • | Coaching | Q75, Q77, Q79, Q65, Q70 |
| Team Outputs | | • | Team Member Satisfaction | Q90, Q94, Q96, Q99, Q98, Q100 |
| | | • | Attachment | Q81, Q89, Q82. |
| | | • | Team effectiveness | Q80, Q88, Q97 |
| | | • | Inter-Team Relationships | Q87, Q95, Q85, Q86, Q93 |
| | | • | Team Innovation | Q83, Q84, Q91, Q92 |

## 6.4.1 Validity

Two forms of factor analysis were used to measure the validity of the ATPI: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA is used to detect unknown factor structures and to refine measures in scale development, while CFA is used to test the fit of a hypothesized factor structure to observed data (Conway & Huffcutt, 2003).

### 1. Exploratory Factor Analysis:

EFA, using SPSS version 15, was adopted to examine the factor structure for the ATPI with principal axis factoring analysis to explain as much of

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the correlations among variables and minimum number of factors and with direct oblimin rotation to improve the correlation between the factors. Conway and Huffcutt (2003) agreed with Ford, MacCallum & Tait (1986) that an oblique rotation was preferred, based on eigenvalue greater than (1.0) scree plot. Regarding which decisions researchers actually make, Ford et al. (1986) found that the most common technique reported was retaining factors with eigenvalue greater than 1 (Conway and Huffcutt, 2003). EFA was tested for the dimensions of team work effectiveness as follows;

First: EFA for team inputs dimensions:

Table 2, based on scree plot (figure 3), shows that there are four factors, each with an eigenvalue close to (1.0) which interprets 46.702% of the variation to the individuals' response in the study sample on the team input scale. The table also shows that the interpreted variance percentage of the first factor was high at (29.087). We can also see that the eigenvalue was relatively high at (9.890) compared with other factors whose eigenvalues were closer and smaller. As a whole these results indicate the possibility of the presence of a prevailing factor reflecting one dimension which is the team inputs. It can also be noted that the item loadings of the team inputs scale on the four factors were high, as the correlation coefficient is more than (0.30) among the items of each factor and the factor that it represents.

## TABLE 2
### Factor Analysis for Team Inputs Items and their Loadings

| Team Inputs Items | Factor 1 | Factor 2 | Factor3 | Factor4 |
|---|---|---|---|---|
| | Team Effort and Skills | Organizational Support | Task Design | Recourses |
| Q1 | .657 | | | |
| Q23 | .607 | | | |
| Q12 | .602 | | | |
| Q20 | .602 | | | |
| Q27 | .544 | | | |
| Q31 | .539 | | | |
| Q10 | .517 | | | |
| Q32 | .514 | | | |
| Q16 | .503 | | | |
| Q5 | .421 | | | |
| Q15 | .348 | | | |
| Q9 | .315 | | | |
| Q11 | | -.711 | | |
| Q22 | | -.690 | | |
| Q33 | | -.645 | | |
| Q8 | | -.635 | | |
| Q29 | | -.570 | | |
| Q18 | | -.546 | | |
| Q4 | | -.536 | | |
| Q25 | | -.523 | | |
| Q14 | | -.460 | | |
| Q19 | | -.445 | | |
| Q26 | | -.384 | | |
| Q3 | | -.359 | | |
| Q13 | | | .660 | |
| Q21 | | | .572 | |
| Q30 | | | .555 | |
| Q2 | | | .528 | |
| Q34 | | | .506 | |
| Q24 | | | .430 | |
| Q17 | | | | .768 |
| Q7 | | | | .674 |
| Q28 | | | | .455 |
| Q6 | | | | .407 |
| Eigenvalue | 9.890 | 2.616 | 1.879 | 1.494 |
| Percentage of Variance | 29.087 | 7.693 | 5.526 | 4.395 |
| Cumulative Percentage of Variance | 29.087 | 36.780 | 42.307 | 46.702 |

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FIGURE 3
Team Inputs Scree Plot
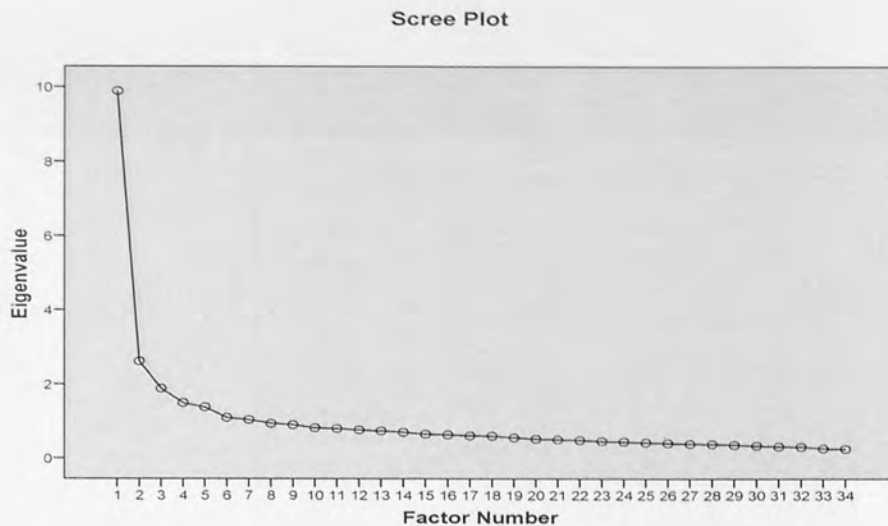
Scree Plot



## Second: EFA for team processes dimensions

Table 3, based on scree plot (figure 3), shows that there are six factors, and they interpret (66.601%) of the variation in the individuals' response in the study sample on the team process scale. The table also shows that the interpreted variance percentage of the first factor is high at (42.080%). We can also see that the eigenvalue was relatively high at (11.783) compared with other factors whose eigenvalues were closer and smaller. As a whole these results indicate the possibility of the presence of a prevailing factor reflecting one dimension which is the team processes. It can also be noted that the item loadings of the team processes scale on the six factors was high, as the correlation coefficient among the items of each factor and the factor that it represented was more than (0.30) except for items (45, 46 and 56) where the correlation coefficient with the factor it represents was less than (0.30). This suggests that these items could be deleted from the ATPI measure.

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## TABLE 3

### Factor Analysis for Team Processes Items and Their Loadings

| Team Processes Items | Factor1 Reflexivity | Factor2 Team Conflict | Factor3 Task Focus | Factor4 Participation | Factor5 Objectives | Factor6 Creativity & Innovation |
|---|---|---|---|---|---|---|
| Q48 | .693 | | | | | |
| Q40 | .603 | | | | | |
| Q36 | .494 | | | | | |
| Q53 | .431 | | | | | |
| Q60 | .422 | | | | | |
| Q37 | .369 | | | | | |
| Q43 | | .843 | | | | |
| Q39 | | .762 | | | | |
| Q51 | | .590 | | | | |
| Q35 | | .560 | | | | |
| Q47 | | .520 | | | | |
| Q49 | | | .912 | | | |
| Q41 | | | .838 | | | |
| Q57 | | | .329 | | | |
| Q42 | | | | .691 | | |
| Q50 | | | | .540 | | |
| Q38 | | | | .533 | | |
| Q56 Lower .3 | | | | | | |
| Q55 | | | | | .733 | |
| Q59 | | | | | .533 | |
| Q61 | | | | | .491 | |
| Q46 Lower .3 | | | | | | |
| Q52 | | | | | | -.685 |
| Q54 | | | | | | -.518 |
| Q58 | | | | | | -.470 |
| Q44 | | | | | | -.431 |
| Q62 | | | | | | -.384 |
| Q45 Lower .3 | | | | | | |
| Eigenvalue | 11.783 | 2.770 | 1.366 | 1.029 | 0.922 | 0.779 |
| Percentage of Variance | 42.080 | 9.894 | 4.877 | 3.673 | 3.295 | 2.781 |
| Cumulative percentage of variance | 42.080 | 51.974 | 56.852 | 60525 | 63.820 | 66.601 |

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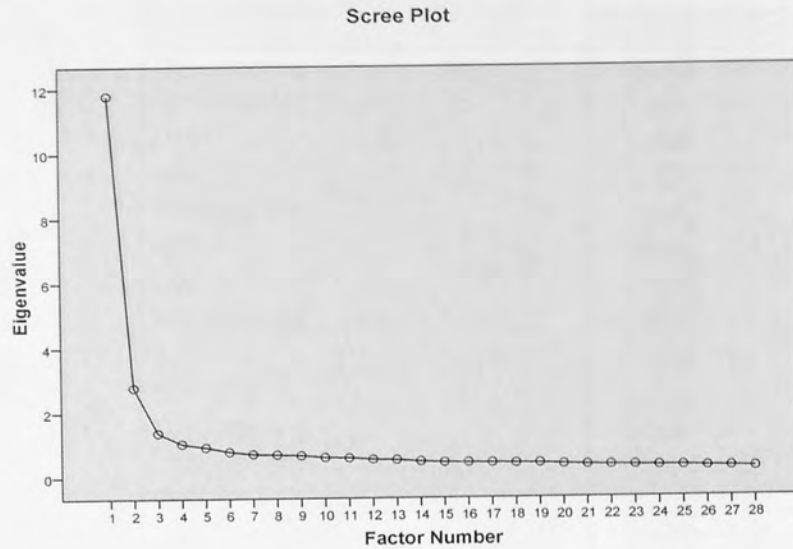
Scree Plot

**Third: EFA for leadership processes dimensions:**

Table 4, based on scree plot (figure 4), shows that there are two factors and they interpret (70.130%) of the variation in the individuals' response in the study sample on the leadership process scale. The table also shows that the interpreted variance percentage of the first factor is high at (64.317%) and that the eigenvalue is relatively high at (10.934) compared with the other factors whose eigenvalues are (0.988). As a whole these results indicate the possibility of the presence of a prevailing factor reflecting one dimension which is the leadership process. It can also be noted that the items loading for the leadership processes scale on the two factors are high, as the correlation coefficient among the items for each factor and the factor that it represents is more than (0.30).

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TABLE 4

**Factor Analysis for Leadership Processes Items and their Loadings**

| Leadership Processes Items | Factor 1 | Factor 2 |
|---|---|---|
| | Managing | Leading |
| Q77 Coaching | 1.014 | |
| Q79 Coaching | .887 | |
| Q74 | .858 | |
| Q76 | .757 | |
| Q75 Coaching | .700 | |
| Q67 | .698 | |
| Q69 | .688 | |
| Q65 Coaching | .631 | |
| Q72 | .579 | |
| Q78 | .571 | |
| Q70 Coaching | .508 | |
| Q66 | | .841 |
| Q73 | | .803 |
| Q63 | | .738 |
| Q71 | | .729 |
| Q68 | | .726 |
| Q64 | | .627 |
| Eigenvalue | 10.934 | 0.988 |
| Percentage of Variance | 64.317 | 5.813 |
| Cumulative percentage of variance | 64.317 | 70.130 |

**FIGURE 5**
Leadership Processes Scree Plot



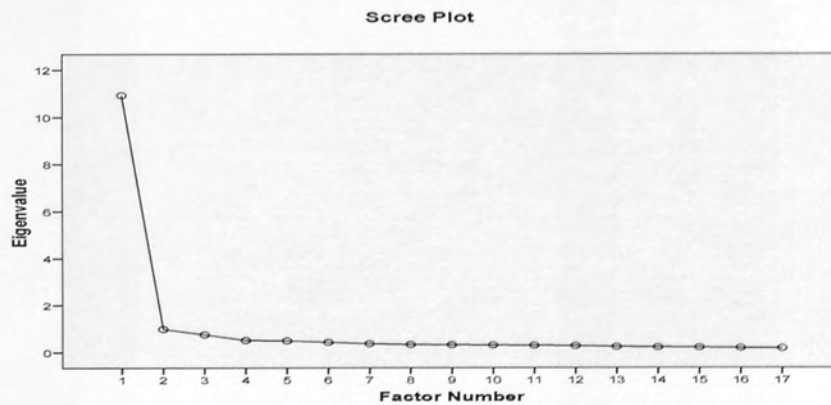Scree Plot

**Fourth**: EFA for team output dimensions:

Table 5, based on scree plot (figure 5), shows that there are five factors and they interpret (67.932%) of the variation in the individuals' response in the study sample on the team outputs scale. The table also shows that the interpreted variance percentage of the first factor is high at (39.817%). We can also see that the eigenvalue is relatively high at (8.362) compared with other factors whose eigenvalues are closer and smaller than the first factor. As a whole these results indicate the possibility of the presence of a prevailing factor reflecting one dimension which is the team outputs. It can also be noted that the items loading for the team outputs scale on the five factors are high, as the correlation coefficient among the items for each factor and the factor that it represents is more than (0.30) except for item (87) where the correlation coefficient with the factor it represents is less than (0.30). This suggests that this item could be deleted from the ATPI measure.

# TABLE 5

## Factor Analysis for Team Outputs Items and their Loadings

| Team Output Items | Factor 1 Team Member Satisfaction | Factor2 Attachment | Factor3 Inter-Team Relationships | Factor4 Team Innovation | Factor5 Team Effectiveness |
|---|---|---|---|---|---|
| Q99 | .803 | | | | |
| Q98 | .752 | | | | |
| Q90 | .749 | | | | |
| Q96 | .677 | | | | |
| Q94 | .629 | | | | |
| Q100 | .620 | | | | |
| Q82 | | -.923 | | | |
| Q81 | | -.921 | | | |
| Q89 | | -.641 | | | |
| Q93 | | | .835 | | |
| Q86 | | | .753 | | |
| Q85 | | | .611 | | |
| Q95 | | | .506 | | |
| Q92 | | | | .869 | |
| Q91 | | | | .731 | |
| Q83 | | | | .669 | |
| Q84 | | | | .539 | |
| Q97 | | | | .447 | |
| Q87 LOWER .3 | | | | | |
| Q88 | | | | | .791 |
| Q80 | | | | | .662 |
| Eigenvalue | 8.362 | 2.024 | 1.752 | 1.160 | 0.968 |
| Percentage of Variance | 39.817 | 9.638 | 8.342 | 5.526 | 4.609 |
| Cumulative percentage of variance | 39.817 | 49.455 | 57.797 | 63.323 | 67.932 |

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FIGURE 6
Team Outputs Scree Plot

**Scree Plot**
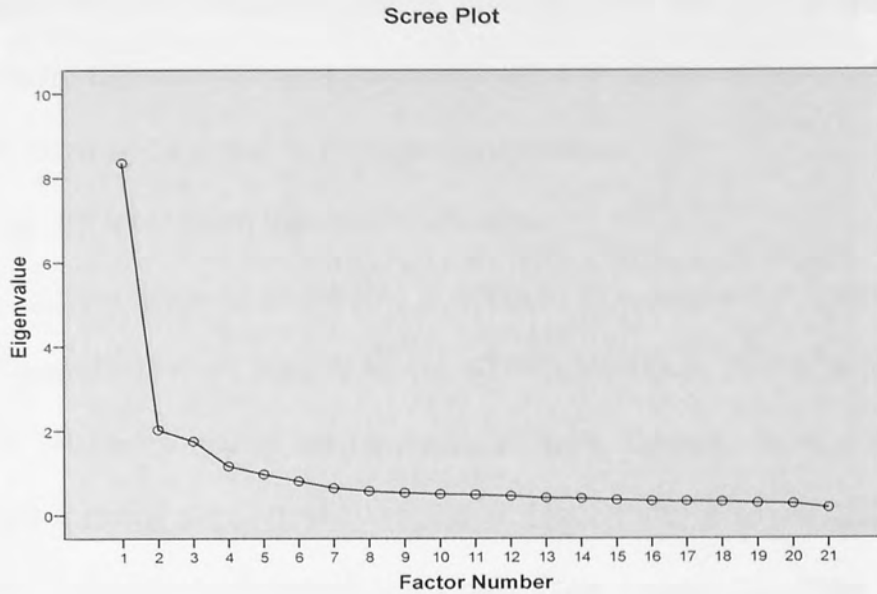


Based on the EFA results the ATPI measure will now contain 96 items after omitting items (45, 46, 56 and 87) which showed low loadings on the factor scale.

## 2. Confirmatory Factor Analysis:

To test the fit of the factor structure for the ATPI dimensions, a confirmatory factor analysis (CFA), using AMOS version 10, was conducted to examine the similarities and differences of the measure fit. In terms of judging the adequacy of the measure, three relative indices were used (Williams Fords and Nguyen 2002). The first is the comparative fit index (CFI) which has been shown to have many desirable properties (Bentler, 1990). It can range in value from (0.0) to (1.0), where higher values indicate better fit, and criteria for good fit have been offered as (0.90), and more recently as (0.95) (Hu and Bentler,1999).

The second index is the Tucker-Lewis Coefficient (TLI) with acceptable levels of fit being above (0.90) and the third index is the root means square error of approximation (RMSEA). This is different from the CFI in that lower values indicate better fit; values less than (0.05) and (0.08) reflect good fit. CFA tested the dimensions of the ATPI measure as follows:

First: CFA for team inputs dimensions:

The following procedure is adopted to examine the relationship between different theoretical models for the ATPI team inputs. Firstly, a one factor model with all team inputs items namely: task design, team effort and skills, organizational support and resources, loaded into a single factor; secondly, a three factors model with all the inputs items loaded into three factors namely: task design, team effort and skills and organizational support and finally, a four correlated factors model for team inputs are run. In the four factor model, the first factor contained all the task design items, the second all the team effort and skills items, the third all the organizational support items, and the fourth all the resources items. Three relative indices (CFI, TLI and RMSEA) together with standardized regression weights were computed to provide and evaluate the model fit. The ratio of chi-square to degrees of freedom (df) was also given. Table 6 displays the CFA outputs for the three different models computed.

TABLE 6
Overall Fit Indices for the Team Inputs Scales

| | CFI | TLI | RMSEA | Chi-Squared | Df | Sample Size |
|---|---|---|---|---|---|---|
| One Factor | .645 | .616 | .104 | 3113.590 | 325 | 797 |
| Three Correlated Factors | .767 | .751 | .076 | 2915.744 | 525 | 797 |
| Four Correlated Factors | .864 | .845 | .085 | 903.165 | 134 | 797 |

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The results in Table 6 indicate that the four correlated factors model is more acceptable in terms of goodness of fit statistics when compared with one and three factor models, although the fit is not perfect. The three relative indices of the four factor model were CFI (0.864), TLI (0.845) and RMSEA (0.08). It was noted that the value of the CFI was below the average and that this is due to the high correlation between variables which is indicated in Table 7 below, especially between task design and team effort and skills (r=0.839). Table 7 indicates high correlations for: task design and team effort and skills; task design and organizational support; team effort and skills and organizational support.

TABLE 7
Team Inputs Dimensions Correlations

|  |  |  | Estimate |
|---|---|---|---|
| Task design | <--> | Team effort and skills | .839 |
| Task design | <--> | Organizational Support | .735 |
| Resource | <--> | Task design | .496 |
| Team effort and skills | <--> | Organizational Support | .663 |
| Resource | <--> | Team effort and skills | .408 |
| Resource | <--> | Organizational Support | .636 |

## Second: CFA for team processes dimensions:

The following procedure was adopted to examine the relationship between different theoretical models for the ATPI team processes. Firstly, a one factor model with all team processes items namely: objectives, reflexivity, participation, task focus, team conflict and creativity and innovation, was loaded into a single factor. Secondly, a six correlated factors model for team processes was run. In the six factors model, the first factor contained all the objective items, the second all the reflexivity items, the third all the participation items, the fourth all the task focus items, the fifth all the team conflict items, and the sixth

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all the creativity and innovation items. Three relative indices (CFI, TLI and RMSEA) together with standardized regression weight were computed to provide and evaluate the model fit. The ratio of chi-square to degrees of freedom was also given. Table 9 displays the CFA results of the two different models computed.

TABLE 8
Overall Fit Indices for the Team Processes Scales

|  | CFI | TLI | RMSEA | Chi-squared | df | Sample Size |
|---|---|---|---|---|---|---|
| One factor | .747 | .728 | .108 | 3587.614 | 351 | 797 |
| Six correlated factors | .842 | .820 | .087 | 2359.589 | 333 | 797 |

The results in Table 8 indicate that the six correlated factors model is more acceptable in terms of goodness of fit statistics when compared with one factor model. The three relative indices were CFI (0.84), TLI (0.82) and RMSEA (0.8). Normally the CFI should have a value of 0.9 or higher to be considered a good fit, however due to the high correlation between the variables, it is argued that it is almost impossible to achieve high levels of fit (Pereira, Hsu and Kundu, 2005). The high correlations identified, as shown in Table 9, are participation and team conflict (r=-1.211), participation and task focus (r=1.000), task focus and team conflict (r=-1.147), objectives and team conflict (r=-1.136), team conflict and creativity and innovation (r= -1.054) and between task focus and creativity and innovation (r=.986)

## TABLE 9
## Team Processes Dimensions Correlations

| | | | Estimate |
|---|---|---|---|
| Objectives | <--> | Reflection on Performance | .823 |
| Objectives | <--> | Participation | .874 |
| Objectives | <--> | Task Focus | .884 |
| Objectives | <--> | Team Conflict | -1.136 |
| Objectives | <--> | Creativity and Innovation | .740 |
| Reflection on performance | <--> | Participation | .887 |
| Reflection on performance | <--> | Task Focus | .897 |
| Reflection on performance | <--> | Team Conflict | -.701 |
| Reflection on performance | <--> | Creativity and Innovation | .858 |
| Participation | <--> | Task Focus | 1.000 |
| Participation | <--> | Team Conflict | -1.211 |
| Participation | <--> | Creativity and Innovation | .952 |
| Task Focus | <--> | Team Conflict | -1.147 |
| Task Focus | <--> | Creativity and Innovation | .986 |
| Team Conflict | <--> | Creativity and Innovation | -1.054 |

## Third: CFA for leadership processes dimensions:

The following procedure was adopted to examine the relationship between different theoretical models for the ATPI leadership processes. Firstly, a one factor model with all leadership processes items namely: leading, managing, and coaching, was loaded into a single factor. Secondly, a two correlated factors model for leadership processes was run. In the two factors model, the first factor contained all the leading items, the second all the managing and coaching items. Three relative indices (CFI, TLI and RMSEA) together with standardized regression weight were computed to provide and evaluate model fit. The ratio of chi-square to degrees of freedom was also given. Table 10 displays the CFA results of the two different models computed.

TABLE 10
Overall Fit Indices for the Leadership Processes Scales

|  | CFI | TLI | RMSEA | Chi-squared | Df | Sample size |
|---|---|---|---|---|---|---|
| One factor | .886 | .870 | .120 | 1484.742 | 120 | 797 |
| Two correlated factors | .916 | .901 | .104 | 1114.612 | 115 | 797 |

The results in Table 10 indicate that the two correlated factors model is more acceptable in terms of goodness of fit statistics when compared with the one factor model. The three relative indices were CFI (0.92), TLI (0.90), and RMSEA (0.10). Meanwhile, Table 11 below indicates that managing and leading are highly correlated.

TABLE 11
Leadership Processes Dimensions Correlations

|  |  |  | Estimate |
|---|---|---|---|
| Managing | <--> | Leading | 0.992 |

## Fourth: CFA for team output dimensions:

The following procedure was adopted to examine the relationship between different theoretical models for the ATPI team outputs. Firstly, a one factor model with all team outputs items namely: team member satisfaction, attachment, team effectiveness, inter-team relationships and team innovation, was loaded into a single factor. Secondly, five correlated factors model for team outputs are run. In the five factors model, the first factor contained all the team member satisfaction items, the second all the attachment items, the third all the team effectiveness items, the fourth all the inter-team relationships items, and the fifth all the team innovation items. Three relative indices (CFI, TLI and RMSEA) together with standardized regression weight were computed to provide and evaluate model fit. The ratio of chi-square to degrees of freedom

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was also given. Table 12 displays the CFA results of the two different models computed.

TABLE 12
Overall Fit Indices for the Team Outputs Scales

|  | CFI | TLI | RMSEA | Chi-squared | df | Sample size |
|---|---|---|---|---|---|---|
| One factor | .659 | .621 | .142 | 3229.977 | 189 | 797 |
| Five correlated factors | .947 | .938 | .061 | 579.107 | 146 | 797 |

The results in Table 12 indicate that the five correlated factors model is more acceptable in terms of goodness of fit statistics when compared with the one factor model. The three relative indices were CFI (0.95), TLI (0.94) and RMSEA (0.06). Table 13, below, indicates that team member satisfaction and attachment; team member satisfaction and team innovation; and team effectiveness and team innovation were highly correlated.

TABLE 13
Team Outputs Dimensions Correlations

|  |  |  | Estimate |
|---|---|---|---|
| team member satisfaction | <--> | Attachment | .652 |
| team member satisfaction | <--> | Team effectiveness | .580 |
| team member satisfaction | <--> | Inter-team relationship | .508 |
| team member satisfaction | <--> | Team Innovation | .660 |
| team effectiveness | <--> | Attachment | .398 |
| inter-team relationship | <--> | Attachment | .353 |
| Attachment | <--> | Team Innovation | .484 |
| team effectiveness | <--> | Inter-team relationship | .574 |
| team effectiveness | <--> | Team Innovation | .647 |
| inter-team relationship | <--> | Team Innovation | .547 |

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## 6.4.2 Reliability

Reliability is a concept which shows how well the different items in a single dimension combine to measure the same thing. The reliability was tested for all the ATPI measure items. Alpha (Cronbach) coefficients were calculated for the components of each measurement scale to verify internal consistency. The internal consistency estimates for every component of each dimension are reported in Table 14. A value of 0.80 or above for coefficient alpha was considered good, while values between 0.70 and 0.80 were considered acceptable and adequate (West et al., 2005; Nunnally and Bernstein, 1994). The results in Table 14 indicate that the Cronbach alpha levels of all dimensions exceeded the value of 0.70 suggested as acceptable by West et al (2005).

### TABLE 14

**Internal Consistency Estimates of Dimensions for the ATPI English Version**

| ATPI Variables | Dimensions | Coefficient Alpha | No. of Items |
|---|---|---|---|
| Inputs | Task design | 0.76 | 11 |
| | Team effort and skills | 0.87 | 8 |
| | Organizational support | 0.87 | 11 |
| | Resources | 0.75 | 4 |
| Processes | Objectives | 0.79 | 3 |
| | Reflexivity | 0.84 | 4 |
| | Participation | 0.89 | 7 |
| | Task focus | 0.78 | 6 |
| | Team conflict | 0.82 | 5 |
| | Creativity and innovation | 0.78 | 3 |
| Leadership | Leading | 0.87 | 4 |
| Processes | Managing | 0.93 | 8 |
| | Coaching | 0.90 | 5 |
| Outputs | Team member satisfaction | 0.89 | 6 |
| | Attachment | 0.88 | 3 |
| | Team effectiveness | 0.75 | 3 |
| | Inter-team relationship | 0.78 | 5 |
| | Team innovation | 0.84 | 2 |

In summary, the ATPI instrument survey which contains 100 items was applied to the UK healthcare sample. However, four items were excluded after the reliability and the validity indicators were examined.

## 6.5 Conclusion

This study succeeded in providing statistical evidence that the ATPI measure has good psychometric properties. It relied upon data collected by the Institute of Health Services Effectiveness at Aston Business School in order to test the psychometric properties of the ATPI measure and these tests were conducted through EFA, CFA, and internal consistency to test the validity and reliability of the measure.